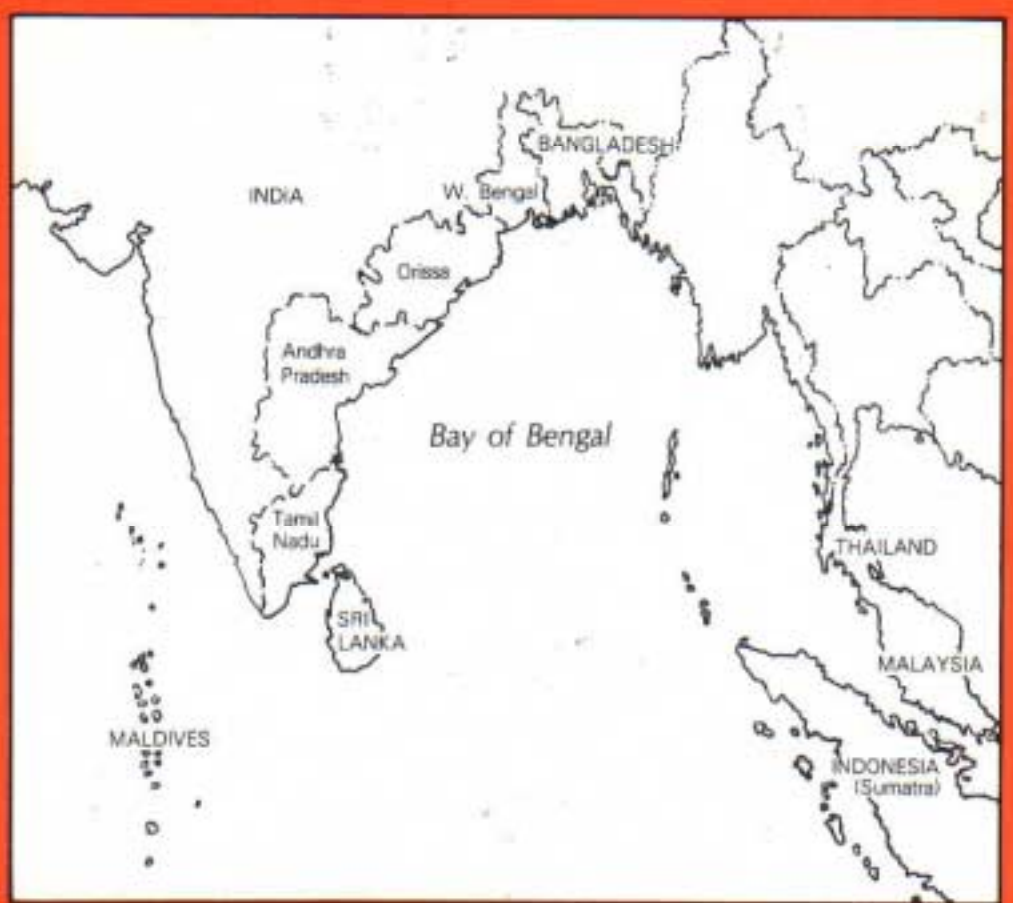
BOBP/REP/50

Report of the Sixteenth Meeting of the Advisory Committee

January 20-23, 1992
Phuket, Thailand



FOOD AND AGRICULTURE ORGANISATION OF THE UNITED NATIONS

REPORT OF THE SIXTEENTH MEETING OF THE ADVISORY COMMITTEE

January 20-23, 1992
Phuket, Thailand

BAY OF BENGAL PROGRAMME
Madras, India
1992

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This document records the recommendations of the 16th meeting of the Advisory Committee of the Bay of Bengal Programme for Fisheries Development (BOBP), held 20-23 January 1992, in Phuket, Thailand.

The document contains the annual reports (or status reports) of the projects in the Programme. These reports briefly recapitulate the objectives and status of the activities, describe the work and achievements during 1991, assess the progress and indicate the work plan for 1992. The reports were prepared at the end of 1991 and presented to the 16th meeting of the Advisory Committee.

The Advisory Committee is composed of member countries, agencies funding BOBP projects, and the FAO. The Committee meets once a year in member-countries on a rotational basis.

The Bay of Bengal Programme (BOBP) is a multi-agency regional fisheries programme which covers seven countries around the Bay of Bengal — Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka and Thailand. The Programme plays a catalytic and consultative role : it develops, demonstrates and promotes new techniques, technologies or ideas to help improve the conditions of small-scale fisherfolk communities in member countries. The BOBP is sponsored by the governments of Denmark, Sweden and the United Kingdom, by member-governments in the Bay of Bengal region, and also by AGFUND (Arab Gulf Fund for United Nations Development Organizations) and UNDP (United Nations Development Programme). The main executing agency is the FAO (Food and Agriculture Organization of the United Nations).

April 1992

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REPORT OF THE SMTEENTH MEETING OF THE ADVISORY COMMITTEE OF THE BAY OF BENGAL PROGRAMME FOR FISHERIES DEVELOPMENT

1. The Advisory Committee of the Bay of Bengal Programme for Fisheries Development (BOBP) held its Sixteenth Meeting from 20 to 23 January 1992 at the Metropole Hotel, Phuket, Thailand. A list of participants is given in Appendix A.

OPENING OF THE MEETING

2. The Governor of Phuket, Dr. Yuwat Vuthimedhi, extended a warm welcome to the participants and the Meeting was formally inaugurated by Dr. Plodprasop Saraswadi, Director General of Fisheries, Thailand.

ELECTION OF CHAIRPERSON

3. The Advisory Committee unanimously elected Dr. Veravat Hongskul, Assistant Director General, Fisheries Department, Thailand, as its Chairperson to hold office until the beginning of its Seventeenth Meeting.

ADOPTION OF THE AGENDA

4. The Advisory Committee adopted the agenda shown in Appendix B. The documents placed before the Committee are listed in Appendix C.

STATE OF THE PROGRAMME

5. The Committee noted the state of the Programme during 1991 as presented in Appendix D.

SMALL-SCALE FISHERFOLK COMMUNITIES

(GCP/RAS/118/MUL, GCP/RAS/ 117/MUL and GCP/RAS/ 126/AGF)

Progress during 1991

6. The progress during the reporting year (Appendix E) was noted as satisfactory.

7. There is an urgent need for cooperating agencies to intensify their efforts,with assistance from the Project as appropriate, to ensure continuation and follow-up of the extension activities before the end of the projects.

8. The private sector should be encouraged to establish hatcheries to cater to the demand of brackishwater culture, with particular emphasis on the training of entrepreneurs.

9. The impact of various subproject activities, such as brackishwater culture development, should be carefully monitored, and reported on, with regard to the number and category of beneficiaries.

10. All fishing technology development should be undertaken keeping in view the status of the fishery resources and be considered in the light of existing, or proposed, management practices.

11. Scientists, planners and development workers should be encouraged to contribute articles to the ***Buy of Bengal News*** and incentives for this purpose should be provided by the Programme, if required, and information about this should be widely circulated in the region.

Evaluation of GCP/RAS/118/MUL

12. The General Findings and Conclusions of the Evaluation Mission (Appendix F) were endorsed, with reservations on such generalizations as there being no need for technology development in

craft and gear because of overfishing. While agreeing that such development should receive low priority in the future, in the context of the Project, it was nevertheless considered necessary with the proviso that it be guided by management considerations.

The Third Phase Proposal

13. The modified proposal for a third phase, incorporating recommendations of the Evaluation/ Appraisal Mission, presented at the meeting was endorsed by the member countries subject to formal clearances.

14. Having learned that SIDA had no immediate plans to continue their support to BOBP beyond the present phase, and that DANIDA, in the light of SIDA's plans about which they had learned only very recently, would have to totally reconsider their position since SIDA's plans had, unfortunately, changed the premises for DANIDA's future financing, the Committee urged both agencies to reconsider their positions favourably and continue their support.

15. FAO should, as a matter of priority, continue the dialogue with DANIDA and SIDA and also contact other donors, if necessary, in order to secure funding support for a third phase.

16. In the unfortunate event that the funding does not materialize as envisaged, consideration should be given to split the proposal into components for different donors.

17. If the proposal is broken down into components, the highest priority should be given to "Resources Management", followed by "Extension Development Support" and "Brackishwater Culture", although this rating might not fully suit all individual countries.

18. If the funding situation is resolved in the near future, and well before the next meeting of the Committee scheduled for early 1993, the Secretariat should convene an extraordinary Advisory Committee Meeting in Madras, with one representative from each country to initiate the elaboration of the Plan of Operation as recommended by the Evaluation/Appraisal Mission.

Targets for 1992

19. In view of the uncertainty of funding support from SIDA and DANIDA beyond the present commitments, the Project should economize its operation by phasing out subprojects and postponing non-essential activities and seek supplementary bilateral funding support. The staff of the projects should also be trimmed wherever possible, without jeopardizing the start of the third phase if funds are made available.

20. The brackishwater subprojects in Bangladesh and India which had, had a late start should be implemented as planned, without curtailment.

IMPROVEMENT OF LIVING CONDITIONS OF WOMEN AND THEIR FAMILIES IN FISHING COMMUNITIES
(FPA/RAS/904/FPA)

21. FAO was requested to convey to UNFPA the Committee's disappointment about the non-availability of funds, after considerable preparatory work (Appendix G) which had raised expectations among the participating fisherfolk and agencies concerned and which would lead to credibility problems for similar activities in the future.

22. There is a need to continue women and family oriented activities and the Programme should seek alternative funding to sustain such efforts.

POST-HARVEST FISHERIES

23. The proposed work plan for 1992 (Appendix H) should be implemented.

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24. In view of the continuing need to improve post-harvest practices and the valuable contributions of the Project, ODA was urged to continue the Post-Harvest Fisheries project irrespective of the decision on the third phase of the proposed DANIDA/SIDA-sponsored Project.

BIO-ECONOMICS OF SMALL-SCALE FISHERIES (RAS/91/006)

25. The proposed work plan for 1992 (Appendix I) should be carried out.

26. Considering the inter-disciplinary (biological, economic and socio-cultural) nature of the work of the project, it is essential that economists, social scientists and biologists together undertake surveys and analyses of results and that they are jointly trained for this purpose.

ASSESSMENT OF POLLUTION HAZARDS IN FISHERIES

27. The project, including the concluding regional workshop in Penang, January 1993, (Appendix J), should be executed as planned.

CLEANER FISHERY HARBOURS

28. In view of the positive results of the Project (Appendix K) in a field of serious concern in all member countries, the Programme should seek further support from IMO and FAO for follow-up assistance in regard to awareness building, training and promotion of cleaner fishery harbours in general.

29. The report on the surveys undertaken by the Project and the associated video documentation should be disseminated as soon as possible and made use of for awareness-building.

30. In view of the importance of the subject, a proposal for a larger project in the third phase of the Programme should be prepared.

31. While BOBP might be able to provide some further technical assistance, there is a need for the countries themselves to continue the monitoring of pollution in fishery harbours and take corrective actions.

NATIONAL PROJECTS IMPLEMENTED THROUGH BOBP

32. The Committee noted that four national projects, with funding arrangements separate from the regional projects, had been implemented through BOBP in 1992 (Appendix L).

OTHER MATTERS

33. The Programme should continue to promote technical cooperation among member countries and sponsor such cooperation on request.

34. The development of shark fisheries should be approached cautiously, since very little information on these resources is available and in view of the low resilience of the stocks.

35. Ways and means of improving the fisheries statistics on sharks for the assessment of the resources and for provision of associated training inputs, should be identified and promoted.

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36. In response to a query from the Secretariat, it was felt that the present Advisory Committee meeting arrangements were satisfactory and that no specific changes need be made for the next meeting.

NEXT MEETING

37. The Committee noted with appreciation the offer of Bangladesh to host in early 1993 the Seventeenth Meeting of the Advisory Committee, in conjunction with the Eight Session of the IOFC Committee for the Development and Management of Fisheries in the Bay of Bengal.

ADOPTION OF THE REPORT

38. The report was adopted on January 23, 1992.

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Appendix A

LIST OF PARTICIPANTS

Bangladesh

Nasiruddin, A Z M	Secretary, Ministry of Fisheries and Livestock, Dhaka.
Rahman, Ataur, A K	Director, Department of Fisheries, Dhaka.
Amin. R	Deputy Secretary, Ministry of Fisheries and Livestock, Dhaka.

DANIDA

Pontoppidan, J	Head of Section, Ministry of Foreign Affairs, Copenhagen.
Jensen, J	Fisheries Adviser, Ministry of Foreign Affairs, Copenhagen.

FAO

Garcia, S M	Director, Fishery Resources and Environment Division, Fisheries Department, Rome.
Doeff, M	Senior Project Operation Officer, Fisheries Department, Rome.

India

Sarma, B C	Additional Secretary, Ministry of Agriculture and Cooperation, Government of India, New Delhi.
Joseph, K M	Fisheries Development Commissioner, Department of Agriculture and Cooperation, Government of India, New Delhi.
Poornalingam, R	Commissioner of Fisheries, Department of Fisheries, Tamil Nadu, Madras.

Indonesia

Wahyono, Untung	Director of Fish Production, Directorate General of Fisheries, Jakarta.
Siregar, Zainuddin	Chief of North Sumatera Provincial Fisheries Services, Medan.

Suseno	Chief, Technical Assistance Section, Directorate General of Fisheries, Jakarta.

Malaysia

Mahmood, (Ms) Rabihah	Head, Planning and Fisheries Management Information Systems, Department of Fisheries, Kuala Lumpur .
Ishak, I	Fisheries Officer, Fisheries Research Institute, Penang.
Mohamed, Kamalzaman	Fisheries Officer, Fisheries Research Institute, Penang.

Maldives

Maniku, H	Director of Fisheries (R & D), Marine Research Section, Ministry of Fisheries and Agriculture, Male
Naeem, A	Assistant Director, Ministry of Fisheries and Agriculture, Male

ODA

MacPherson, N	First Secretary (Fisheries) ODA, British High Commission, Dhaka, Bangladesh.
Ames, G R	Acting Head, Livestock and Fisheries Department, Natural Resources Institute, Chatham.
King, D	Post-harvest Fisheries Adviser, Fishery Technology Development Division, Department of Fisheries, Yannawa, Thailand.

SIDA

Torell, M	Senior Programme Officer, Natural Resources Management Division, Stockholm.
Larsson, S	Swedish Centre for Coastal Development and Management of Aquatic Resource (SWEDMAR), Goteborg.

Sri Lanka

Atapattu, A R	Director of Fisheries and Aquatic Resources, Department of Fisheries and Aquatic Resources, Colombo.

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De Silva, Y R,	Director, National Institute of Fisheries Training, Colombo .
Molligoda, M R P	Chairman, National Aquatic Resources Agency, Colombo.

Thailand

Hongskul, Veravat	Assistant Director-General, Department of Fisheries, Bangkok.
Duangsawasdi, Maitree	Director, Fishery Policy and Planning Division, Department of Fisheries, Bangkok.
Bhatia, Udom	Director, Phuket Marine Biological Center , Phuket .
Promsakha NaSakolnakorn Wiwatanachai,	Director, Andaman Marine Fisheries Development Center, Phuket.
Thamnasavet, Thaavorn	Director, Coastal Aquaculture Development Center, Phuket.
Yuktanonda, Sumalee	Chief, Foreign Relations Subdivision, Fishery Policy and Planning Division, Bangkok.
Tookwinas, Siri	Senior Fishery Biologist, Coastal Aquaculture Division, Department of Fisheries, Bangkok.
Chotimanotham, J	Foreign Relations Subdivision, Fishery Policy and Planning Division, Department of Fisheries, Bangkok.

OBSERVERS

Myanmar

Than Tun	Deputy Director, Department of Fisheries, Ministry of Livestock Breeding and Fisheries, Yangon.
Myint Kyaw	Assistant General Manager, Marine Production Department, Myanmar Fisheries Enterprise, Yangon.

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EEC

te Pass, A	Head of Division for South Asia, Director General External Relations, E C Commission, Brussels.

BOBP/Secretariat

Engvall, L 0	Programme Director, Madras.
Angell, C	Senior Aquaculturist, Dhaka.
Bostock, T W	Post-Harvest Fisheries Adviser, Madras
Fernando, C	Development Adviser, Madras.
Holmgren, S	Environment Adviser, Madras.
Kristensen, (Ms) H	Socio-Economist, Madras.
Pajot, G	Senior Fishing Technologist, Madras.
Roy, R N	Extension/Training Officer, Madras.
Sivasubramaniam, K	Senior Fishery Biologist, Madras.
Kelaart, (Ms) C	Admin. Assistant, Colombo.
Vincent, (Ms) C	Secretary, Madras.

Appendix B

AGENDA

20 January

1. Opening of the meeting
2. Election of chairperson
3. Adoption of the agenda
4. State of the Programme
5. Small-scale Fisherfolk Communities (GCP/RAS/118/MUL, GCP/RAS/117/MUL, GCP/RAS/126/AGF)
   a. Progress during 1991

21 January

5. Small-scale Fisherfolk Communities (continued)
   b. Evaluation of GCP/RAS/118/MUL
   c. The 3rd phase proposal
   d. Targets for 1992
6. Improvement of Living Conditions of Women and their Families in Fishing Communities (FPA/RAS/904/FPA)
7. Post-Harvest Fisheries (ODA)

22 January

8. Bio-economics of Small-scale Fisheries (RAS/91/006)
9. Assessment of Pollution Hazards (SWEDMAR)
10. Cleaner Fishery Harbours (IMO)
11. National projects implemented through BOBP
12. Other matters
    a. TCDC.
    b. Pelagic shark
    c. Cooperation with other projects/organizations
13. Next meeting

23 January

14. Adoption of the report

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Appendix C

LIST OF DOCUMENTS

1. Agenda
2. List of documents
3. List of participants
4. State of the Programme – 1991
5. Annual Report 1991 – Small-scale Fisherfolk Communities (GCP/RAS/118/MUL, GCP/RAS/117/MUL, GCP/RAS/126/AGF)
6. Summary report of the evaluation of GCP/RAS/118/MUL and the appraisal of the third phase proposal
7. Project proposal for BOBP's third phase
8. Project Report – Improvement of Living Conditions of Women and their Families in Fishing Communities (FPA/RAS/094/FPA)
9. Annual Report 1991 —Post-Harvest Fisheries (ODA)
10. Annual Report 1991 – Bio-economics of Small-scale Fisheries (RAS/91/006)
11. Annual Report 1991 – Assessment of Pollution Hazards in Fisheries (SWEDMAR/SIDA)
12. Project Report – Cleaner Fishery Harbours (IMO)
13. Annual Report 1991 – National projects implemented through the BOBP.
14. Opportunities for Technical Cooperation between Developing Countries
15. Offshore fisheries for large pelagic shark
16. Externally supported projects in the Bay of Bengal region

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Appendix D

STATE OF THE PROGRAMME

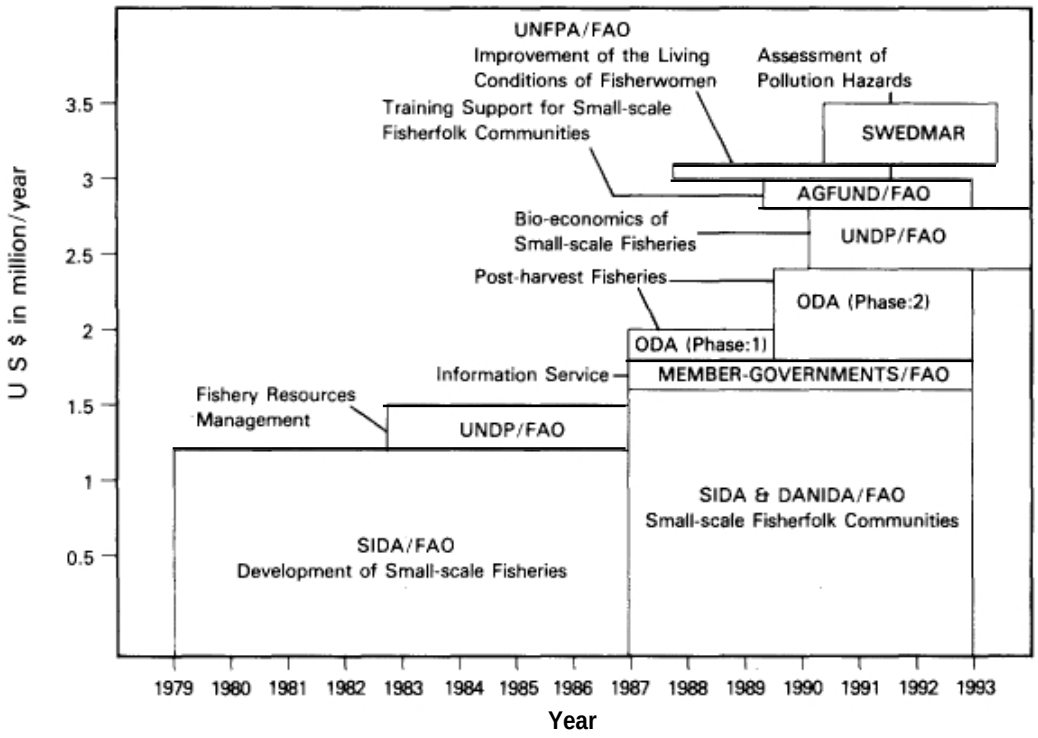
1991

GENERAL

1. 1991 was the fifth year of the second phase of the Bay of Bengal Programme (BOBP). The phases are defined by the contributions of the major donors to the "mother" project of the Programme. The first phase (1976-86) was categorized as technology development and entirely funded by SIDA. The second phase (1987-92) is extension oriented and has been jointly funded by DANIDA and SIDA. Besides the "mother" project, seven other projects, supported by different agencies, have been in progress under the BOBP umbrella during 1991. A graphical representation of the state of the programme and its evolution is given in Figure 1. The main features of the projects are given below, while the progress, status and plans for individual projects are elaborated in separate reports.

Figure 1

BOBP : Projects and funding sources



Regional projects

2. The "Small-Scale Fisherfolk Communities" Project (GCP/RAS/118/MUL) has a six-year duration (1987-92) and has a total budget of around US$ 10 million.

During 1991, the project undertook work in the disciplines of Extension, Brackishwater Culture, Fishing Technology and Development Support. In addition, a one year environmental study on the catches and utilization of dolphins in Sri Lanka has been initiated. The project was evaluated by a joint DANIDA/SIDA/FAO Mission in October-November 1991. The evolution team appreciated the good work and progress made by the project, but expressed concern about the difficulties in developing and introducing new technologies and methodologies and about the problems of sustainability and follow-up of some of the project's activities.

3. The member countries have continued to support the Information Services of BOBP through financial contributions (about US$ 100,000 per year). Although the Information Service is an integral

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part of the "mother" project and services the entire Programme, it is treated as a separate project (GCP/RAS/117/MUL) for administrative reasons.

4. GCP/RAS/126/AGF is also a support project to GCP/RAS/118/MUL and is funded by the AGFUND (Arab Gulf Fund for United Nations Organizations). This funding is solely intended for training activities. The budget is US$ 400,000 for three years (1990-92). The project has so far been fully utilized, but the disbursements from AGFUND are lagging behind by about one year.

5. The second largest project, which also started at the beginning of the second phase (1987), deals with Post-Harvest Fisheries. It is funded and executed by the ODA. The budget is in the order of US$ 1.6 million over 4% years. The project is scheduled to be terminated by April 1992. The project was evaluated during 1991 and the outcome was positive. A new phase of the project is in the process of being formulated.

6. A project for "Improvement of Women and their Families in Fishing Communities" was initiated in 1989 with a preparatory phase which was completed in 1990. Approval of the implementation phase was awaited in 1991. In the meantime, activities were initiated utilizing unspent funds from the preparatory phase. However, in the middle of the year, BOBP was informed that, while the project was approved in principle, UNFPA was unable to make funds available, as funds for regional activities in other regions had already been over-allocated. Women and family oriented activities already initiated have, on exhaustion of UNFPA funds, been taken over by GCP/RAS/118/MUL.

7. "Assessment of Pollution Hazards in Fisheries" is a new project and was started in 1991. It has a duration of about two years. The budget is about US$ 600,000 and is sponsored by SIDA. It is executed by SWEDMAR under the BOBP umbrella. The objective is to assess pollution problems as they affect fisheries. The findings will be presented and discussed at a seminar in early 1993.

8. A one-year project, "Cleaner Fishery Harbours", has been completed during the year at an expense of about US$ 50,000. It is sponsored by SIDA, through the IMO. It is a follow-up of an earlier national pilot project .on "Reception Facilities for Oily Residue and Garbage in Vishakhapatnam Fishing Harbour, India". Selected fishery harbours have bken surveyed by a team of national consultants to assess pollution problems. The findings were discussed in a regional workshop just before the end of the year.

9. The latest regional project of the Programme is one called "Bio-economics of Small-scale Fisheries". It is funded by the UNDP and has been in the pipeline for many years, but became operational only in May 1991. The project was designed for a duration of 3% years with a budget of US$ 1 million. However, since some of the bio-economic work was already started under GCP/RAS/118/MUL, and since costs have escalated significantly from the time the project was formulated, the duration has been reduced to 2.6 years but with the same budget.

National projects

10. A few national projects have been implemented through BOBP during the reporting period. They are :

- "Reef Fish Research and Resources Survey" (Phase II), in the Maldives. This project was funded by UNDP for two years with a budget of US$ 360,000. Besides a wealth of scientific data, the project has resulted in an initial estimate of the potential yield for reef fish.
- "Training for Fisherfolk" in Sri Lanka, funded by UNDP, is a national project which has received assistance from BOBP from the middle of 1990. The project was terminated at the end of 1991.
- "Credit for Motorization of Chandi Boats in Bangladesh" is a project funded by DANIDA to the tune of US$ 200,000. It should have been terminated during the reporting year, but has been extended, primarily because of the setbacks suffered during the April cyclone in Bangladesh.
- "The Programme for the Relief of Cyclone Affected' Fisheries Sector" in Bangladesh is a TCP project funded directly by FAO. BOBP is assisting in the specification and disbursement of equipment and material for relief and rehabilitation.

Project proposal

11. The project proposal for a third phase of BOBP has been elaborated during the year in accordance with the recommendations of the Advisory Committee expressed at the Fifteenth Meeting. The proposal has also been appraised by the DANIDA/SIDA/FAO mission that evaluated GCP/RAS/ 118/MUL. The appraisal team has fully endorsed the project proposal with only minor modifications. The main features of the proposal are fisheries management and institution building.

12. A new phase of the project for "Post-Harvest Fisheries", to start from the end of the present phase in 1992, has been prepared and is likely to materialize. The project proposal takes note of the experience of the previous years and it is envisaged that it will contribute to increased incomes of small-scale fishery communities by reducing post-harvest losses, improving quality of fish and better use of less-favoured fish species.

13. At the Fifteenth Meeting of the Advisory Committee it was noted with appreciation that an offer of Japanese assistance had been made through FAO for a project on communication with, and organization of, fisherfolk. The project has, however, not materialized, for reasons not stated by the donor agency.

Other matters

14. The Fifteenth Meeting of the Advisory Committee requested the Secretariat to explore the possibilities of the Programme interacting with the World Conference on Environment in 1992 and the Global Environment Facility Fund. In pursuing this matter it was found that both the Conference and the Fund are handled on high political and administrative levels both in the countries as well as in the international organizations concerned, making it impractical for the Programme to interact directly.

15. Other recommendations of the Committee at its Fifteenth Meeting are dealt with in the annual reports of the respective projects of the Programme.

Appendix E

SMALL-SCALE FISHERFOLK COMMUNITIES IN THE BAY OF BENGAL (GCP/RAS/118/MUL, GCP/RAS/117/MUL, GCP/RAS/126/AGF)

Annual Report - 1991

1NTRODUCTION'

This report primarily deals with the progress of work during 1991 and proposed targets for 1992 of BOBP's "mother" project, "Small-Scale Fisherfolk Communities in the Bay of Bengal", GCP/RAS/118/MUL, funded by DANIDA and SIDA. But it also covers the projects GCP/RAS/117/MUL and GCP/RAS/126/AGF, which constitute funding support to the "mother" project for the Information Service, funded by the participating governments, and for training activities, funded by AGFUND (Arab Gulf Fund for United Nations Organizations).

GCP/RAS/118/MUL and GCP/RAS/126/AGF have supported work in the disciplines of Extension, Brackishwater Culture, Fishing Technology and Development Support, while GCP/RAS/117/MUL has provided services for all disciplines of BOBP.

The report contains a narrative summary for each discipline which highlights the year's work, problems, issues and future plans. The subprojects under each discipline are then discussed in a table format that gives information about objectives, targets, achievements, status and future plans.

While the subprojects and activities belong to particular disciplines, from a managerial and administrative point of view, nearly all of them are of multidisciplinary nature in varying degrees. Subprojects under the technical disciplines have, for instance, had significant inputs from Extension and Development Support and vice *versa.* Therefore, the reporting does not give an accurate picture of the work performed by each discipline, but is a picture of the project as a whole.

EXTENSION

With the end of the Project only a year away, it is perhaps appropriate not only to report on the achievements of the past year, which the detailed subproject reports do in the following sections, but to ponder a while on what will be left behind at the end of the project.

Going clockwise around the bay, in the Maldives, where the intention was to establish an extension service, in pilot form, it is quite clear that the bulk of fisherfolk needs and concerns fall outside the mandate of the fishery agency. The Ministry, and the extension staff in particular, has begun the complex and often difficult task of facilitating inputs from other agencies and departments to fisherfolk. More importantly, a clear niche has been identified for the Ministry to work with fisherfolk, in addressing the management of reef resources. The extension staff would have gained experience in developing communication and extension material and in enabling a consultative process which could perhaps lead to the communities managing their resources.

In Sri Lanka, the Ministry has committed the budget to take over the fisherfolk radio programme. The staff of the radio unit are trained and have shown their capability of being able to independently keep the programme on the air. While there is room for improvement, particularly in the broadcast of technical matters, there is no doubt that the programme is getting through and fisherfolk are beginning to tune in to it and enjoy it. The programme should continue and flourish, provided the Ministry is able to create a managerial environment that enables the radio staff to work creatively. How the Ministry creates opportunities for the personal betterment of the staff's careers over time will determine how sustainable the programme will be.

In Bangladesh, a learning exercise to evolve the way to a marine fisheries extension service has been'attempted. The effort shows that a group of field staff given training, motivation, some support and a conducive environment can do excellent work in addressing the needs of the fisherfolk

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communities. The effort in terms of finances and in terms of the expertise, needed to get it in motion, is available in-country and can be replicated. What is more important is what has been, and will be, learnt about how to go about providing extension services and what aids and constrains the process. This learning, a detailed training manual to enable replication and a visible success, arm the country should it want to go the route, and the indications are that Bangladesh is planning to spread the approach over the coastal region. The most difficult aspect for the government is to come to grips with organizational change, which will be absolutely necessary to create the environment to get the best from their staff.

Extracting the learning from the project in Thailand is well underway and the proposed workshops with Department of Fisheries staff during the next year will give the government an opportunity to see how best it should organize itself to provide integrated development services to coastal fisherfolk communities. The learning will be important, even given the advanced state of fisheries technical capability in the country, because it points out the issues and concerns of tuning a technology into a local eco-system, extending it and the staffing and organizational structures needed to do justice to the task.

In North Sumatera, Indonesia, even given the fact that it will be some time before it can be said with confidence that group mobilization, and aiding the managerial capacity of group enterprises, is an economic and social success, enough is known already to say that the path is the right one. What is not clear is whether the fisheries agencies will be able to build up the staff expertise necessary, and enable and motivate them to spend the long periods that seem necessary to help fisherfolk better manage their enterprises. The project will not only leave behind this difficult question, but the learning of the effort, the training manuals and a few staff who have showed it can be done.

The several projects and experiences of extension in BOBP have brought into sharp focus several crucial questions that the learning from the projects will at least partially, help address. What really is extension in fisheries? How best should it be done? Should it be done by fishery agencies at all, or is it better sub-contracted to private, non-governmental and even other government agencies? Is it enough to concern ourselves with techniques, approaches and methods of extension and not worry about the organizations that have to carry these? How does one go about promoting organizational change? The discussions, the sharing, the learning, in and amongst the projects and the staff, will perhaps leave behind some illumination on these issues that may light the paths of extension to development.

The focus in 1992 will be, on the one hand, to hand over activities to the counterpart fishery agencies and, on the other, to extract the learning from the projects and document them. Efforts at the fisherfolk community level and, in particular, those incorporating revolving funds, will be assisted to make themselves sustainable. The learning will have to be extracted not only from individual subprojects but also from the extension effort as a whole. Sharing the reports and learning with counterpart agencies in workshops and through publications will culminate the unit's activities for the year.

Subproject : General Services (EXT/GEN)

Targets 1991	*Achievements*
Promotion of fisher NGOs through catalytic efforts with NGO funding agencies.	Meetings were held with selected NGO funding agencies in India to discuss how to promote NGO involvement in fisheries and fisherfolk development. Funding agencies are eager to support fisher NGOs and suggested various activities BOBP could undertake to facilitate such support. *(See Bay of Bengal News No. 43).*
National Consultation on Fisheries Extension in Bangladesh (in cooperation with DANIDA).	Postponed to March 1992 under EXT/FED/BGD. The severe cyclonic storm in Bangladesh, and the subsequent rehabilitation effort, made preparation for the consultation, and participation by government staff, difficult.

Studies of experiences/ opportunities of subcontracting extension components	Postponed till 1992.
Training inputs to women fish vendors in -managing fish market.	On-line follow-up and training in management and problem solving were provided. A study was undertaken to better understand the marketing bottlenecks which prevents the market from supplying fish of sufficient quality and variety, on the one hand, and to understand the problems of utilizing the market to capacity, including political interference, on the other. The recommendations are being taken up with the Corporation of Madras.
Carry over from 1990	The desk study on the state of the art of economics of fisheries extension and of evaluating the impact of extension was completed and a summary appeared in *Bay of Bengal News No. 43.*

Targets 1992

- Assessment of merits and possibilities of subcontracting extension components.
- Training of selected country/project staff in management of fisherfolk enterprises.
- Production of extension worker's handbook on management of fisherfolk enterprises.
- Documentation and reporting of BOBP's extension experience in general.

Subproject : Fisheries Extension Services, Maldives (EXT/FES/MDV)

OBJECTIVES	Establishment of a fisheries extension unit and training its staff. The targets of the subproject are fisherfolk communities in Meemu, Vaavu and Faafu Atolls. A countrywide expansion in due course is envisaged.
STATUS 1990	A subproject to establish a pilot fisheries extension service was agreed to late in 1988 and initiated in 1989. The Ministry of Fisheries and Agriculture (MOFA) established an extension unit and allocated four staff to the subproject. Training of staff was undertaken in participatory rapid rural appraisal methods, needs analysis techniques, improved drying of fish and extension methodology, on-line and in countries of the region. Selected fisherfolk were trained in improved salt-drying of fish, maintenance of inboard diesel engines and in the manufacture of Japanese lures. Four types of boat-hauling devices were constructed and demonstrated. The fisherfolk preferred the steel capstan and MOFA took up regular supply of the devices on its own, using a credit scheme supported by UNCDF. The extension unit undertook rapid appraisals of all 19 inhabited islands in the target area. The status and needs analysis clearly showed that the priority problem areas do not fall within the mandate of MOFA. Catalytic action with other Ministries, to facilitate development and to make available fisheries infrastructure, did not produce significant results due to various reasons.

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Targets 1991	*Achievements*
Identification of island and atoll level options to improve fish handling and collection, fish processing and energy efficiency	The status and needs study was published and discussed at an inter-ministerial level meeting. (See BOBP/WP/76 and ***Buy of Bengal*** News No. 41). The results were also discussed with fisherfolk and island development committees of all 19 islands in the target area. The consensus of the fisherfolk was that the project should address the management of marine resources on the reefs and the problems relating to reef openings, harbour silting and erosion related to jetty constructions. The women's committees were specifically interested in collective action to address rat and bat infestation and in the possibility of improved access to health care and health and population education.
Orientation of and training inputs to Island Development Committees and link fishermen	MOFA and the Atolls Administration felt that rather than evolve a new cadre of contact fisherfolk, the project should work with, and through, the Island Development Men's and Women's Committees. During four extended field visits, discussions and training in the priority areas, identified by the fisherfolk, were held. Resource persons from Ministry of Health, Public Works Department and Atolls Administration were used. The rat and bat infestation problem was addressed in nine islands of Meemu Atoll, with material inputs and advice from the Department of Agriculture. Posters were developed in the areas of health, resource management and population issues and distributed in the islands after discussion. Information kits on commonly used contraception devices were developed with the Ministry of Health and distributed to nine islands in Meemu. Fisherfolk workshop, bringing together people from all nineteen islands, were held at Muli, Meemu Atoll, in connection with Fishermen's Day, to discuss the concerns and needs of fisherfolk, island and atoll level initiatives, and the project's activities.

Assessment

The publication and subsequent inter-ministerial discussion of the status and needs of fisherfolk study clearly identified, for the first time, the clustering of the problems and needs, and the complex interaction of forces that result in problems. The awareness generated about the need for integrated action is positive, but it is still not clear how best to achieve it or the role that MOFA can play, given its mandate. The enthusiasm of the fisherfolk and the Island Development Committees, their clear definition of four problem areas to work in, and the subsequent action by the project shows that much can be achieved by building up the managerial and problem solving capacity of the Island Development Committees. And, given the logistic problems, self-reliance, at least in the near future, may be the best and most realistic option for the island dwellers.

With the project period nearing its end, the primary concern is that, while the extension activity is meeting the needs of the community to a certain extent, given the manpower shortages, the difficult logistics, the difficulties in inter-ministerial facilitation and, most importantly, the lack of clear management commitment in MOFA, the possibility of even a non-traditional fisheries and fisherfolk extension service emerging is low.

However, there is a growing concern amongst fisherfolk, and within MOFA, about the marine resources. Hence, considering the capacity of MOFA in resource management, extension and training

materials could be developed and the extension services used in its dissemination. In the process, this would build up a dialogue with fisherfolk which could lead to management practises.

Targets 1992

Support to selected Island Development Committees through training, visits, material inputs and inter-departmental facilitation, in the areas of :

- marine resource management,
- erosion and siltation problems in islands,
- health and population education and care, and
- eradication of rat and bat infestation.

Development and dissemination of extension materials in cooperation with MRS relating to :

- giant clam fishery
- beche de mer fishery
- reef shark fishery
- coral and sand mining

Documentation of the learning from the project.

***Subproject : Fisherfolk* Radio, *Sri Lanka* (EXT/RDO/SRL)**

OBJECTIVES	Introduction of a radio programme as a communication and extension tool to help fisherfolk in their development. It is hoped that the radio programme, through participative programming, will give fisherfolk a voice.
STATUS 1990	In 1988 a programme strategy was evolved based on an audience profile of fisherfolk in the target area, which assessed the needs, concerns and characteristics of the fisherfolk. A radio programme unit (RPU) with five fisheries officers, and a team leader deputed from the Sri Lanka Broadcasting Corporation (SLBC), was established within the Ministry of Fisheries and Aquatic Resources (MFAR). The RPU staff were trained by SLBC in radio production and broadcast and in the use of field recording equipment, by the Social Communication Centre, Colombo, in story development and writing for radio, and by an international consultant in interviewing skills, recognising a good story, researching it and presenting it. MFAR convened a steering committee to guide the RPU in its programming and to insulate it from external pressures. The programme went on the air on 2.1.89 with daily 5-minute broadcasts and a 15-minute broadcast on Sundays, on the Sinhala Commercial Service of SLBC, and has been on the air uninterrupted since then. IRED, an NGO, was contracted to undertake regular, informal feedback/monitoring studies. The programme was evaluated by 'an international consultant who clearly pointed out the potential of the programme and recommended more effort at reaching the target group, making programmes more attractive, further training to RPU staff and organizational changes. Increased fisherfolk participation, the need for improved technical fisheries programming and the financial sustainability of the programme were other concerns that needed to be addressed.

Targets 1991	*Achievements*
Programme timing changes based on audience needs study	Not done. Audience needs did not show clear consensus for change; and, SLBC could not offer alternate time-slots on a sustained basis.
Training of RPU staff in interviewing	Done. International consultant and BOBP Information Officer conducted two training programmes.
Arrangements for improved and more comprehensive coverage of technical fisheries information	Facilitation of interaction and cooperation between RPU and technical officers achieved some improvements. However, fisheries technical programming capability still remains a concern.
Partial commercial sponsorship of programming	Attempted with no success. Potential sponsors felt low buying power of fisherfolk did not justify investment. However, there was some interest shown by government financial institutions/banks which needs to be followed up.
Determination with GOSRL by July '91 re. RPU location, management and financing to enable sustainable programming	GOSRL is committed to continuing the programme after BOBP's withdrawal. A budget of Rs. 1 million has been sanctioned, which is a little less than required, and GOSRL has requested BOBP to bridge the gap. Discussions are in progress regarding the location of the RPU, which continues to function within DFAR, and on providing a management structure conducive to creative media enterprise.
Subject to sustainability of programme decision by MFAR :	
Equipment supply	Ordered as per recommendation of evaluation; expected early '92.
Training of RPU staff in use of editing, mixing and master recording equipment	Arranged with SLBC, who will provide training, upon receipt of equipment.
Regional workshop to promote radio as a fisheries /extension tool	Regional Workshop held in Colombo in August. Commitments received from Sri Lanka, Bangladesh, Thailand and Indonesia for the establishment and/or promotion of fisherfolk radio programmes (reported in ***Bay of Bengal News No. 43).***
Unscheduled	Participation of fisherfolk in programming enhanced through follow-up programming, including recording of discussions of fisherfolk on programmes for subsequent broadcast, establishment of fisherfolk listener groups and incentive programmes which distribute T-shirts to fisherfolk who make contributions to the programme.

Assessment

The quality of programming, as a result of ideas and approaches incorporated from the training of the RPU staff and the participation of fisherfolk, has clearly shown progress, as is obvious from the very positive response of the fisherfolk. While technical fisheries programming still remains a concern, the consensus of the regional workshop was that complex technical programmes of the how-to-do type are not really suitable for broadcast. More effort is needed in developing this area.

The RPU staff have shown their capability of producing an interesting and useful programme and their enthusiasm is bound to further improve the effort. *The financial sustainability of the programme has been, by and large, assured by the government commiting funds to the activity.

However, a creative activity such as radio will, and does, depend on the management environment within which it functions. The questions as to where the RPU should be located, how it should be managed and how the staff's career development and compensation are to be met need immediate consideration to ensure the sustainability of the quality of programming.

Targets I992

- Training of RPU staff in the use of new equipment.
- Determination with MFAR and SLBC on RPU Management.
- Financial bridging (financial support to MFAR) till March 1992.
- Transfer of inventory and handover to GOSRL by March 1992.
- Reporting of project.

Subproject : Fisheries Extension Development, Bangladesh (EXT/FED/BGD)

OBJECTIVES

Demonstration of extension support to fisherfolk communities through training, technology transfer and support of pilot extension schemes.

The immediate targets are the fisherfolk communities of the Patuakhali and Borguna districts of Bangladesh. The coastal fisherfolk have had little, or no, extension services because marine fisheries have had low priority in freshwater-predominant Bangladesh. The subproject hopes to demonstrate that a trained cadre of DOF extension and NGO staff, with some logistic support, project financing support and functioning in a participative manner, can address the needs and problems of fisherfolk communities.

STATUS 1990

The project began in July 1989. DOF staff from all ***uppazillas*** in the two target districts and staff from two NGOs received training in rapid rural appraisals, participatory needs analysis, and planning and project management in four separate sessions interspersed with 8-10 weeks of fieldwork where they put their learning to test. The participating staff were also trained in group mobilization and management, and were made aware, through orientation workshops, of the problems and opportunities in freshwater culture and post-harvest technologies.

Out of the training and fieldwork emerged 36 project ideas based on the priority needs of the community. In discussions with the communities and the DOF, 18 of the project formulations were accepted for funding and implementation.

The enthusiasm, participation and the quality of work of the DOF staff have been of a high level. However, given the organizational cultures prevalent, there is a need for constant supervision and support, which has been made available through quarterly review workshops and through placing a full-time trainer in the field. A manual to enable learning and replication of the effort aimed at extension staff was under development.

Targets 1991	*Achievements*
Training of DOF and NGO staff in savings and credit management	Done to enable staff to assist fisherfolk in savings mobilization, revolving fund management and in management of credit based projects.
Implementation of 18 ***uppazilla*** and NGO project activities	Fisherfolk men's and women's groups motivated, mobilized and functioning in 18 locations, undertaking savings mobilization, revolving fund management and pilot projects in the areas of finfish hatcheries/nurseries, culture of ***tilapia nilotica,*** carp and carp/ macrobrachium, poultry rearing, homestead forestry, credit schemes for boat/net repair and fish trading, salting of hilsa, health and population education. The activities are on-line and on schedule with good repayments. Ten out of 18 projects are working above plan expectations. Twelve of the pilot projects needed credit support. A revolving fund scheme, based partially on savings of fisherfolk, has been established with good repayments to date.
Orientation workshop on the subproject for ***uppazilla*** chairman (DOF)	Not done. DOF plans to hold it early in 1992.
Learning/sharing workshops for DOF and NGO staff every three months	Done. Formats for monthly planning and reporting have been evolved and are being put to use. The performance of DOF-supported activities far excel the NGO-supported activities (which is surprising).
Orientation workshop for DOF and NGO staff on Fishing Resources Management	Not done. Postponed to early 1992 due to unavailability of DOF trainer.
Study visit to projects within Bangladesh to facilitate implementation of projects	Was found to be unnecessary at this stage of project implementation.
Assistance to DOF on utilization of manuals/documents for field level fisheries officers	The manual has been developed and finalized in discussion with resource persons in DOF and from selected NGOs. The manual, is being printed in Bangla (BOBP/MAG/8) and will be distributed by DOF to all district and ***uppazilia*** level staff. Requests for the manual from NGOs are also coming in.
Unscheduled	With the cancellation of the main phase of the UNFPA project, the women's activities were incorporated into the subproject. A coordinator and a project assistant have been appointed. Twenty women's groups have been mobilized in ten villages of Patuakhali and are participating in such activities as savings mobilization, identification of enterprises for income generation, skills and management training, health and population education and access facilitation. The enterprises are expected to go on-line early in 1992 with some credit support. A video film on the project activities was produced by a local media NGO, SAVE.

Assessment

The subproject is functioning well and it can be said with confidence that, with good training, motivation and management, the district and ***uppazilla*** staff of DOF can rise to the occasion and perform well in developing and managing participatory pilot activities for fisherfolk. Two areas of concern are :

1) The technical knowledge and capability of the staff in fisheries is low, and needs to be built up; the fact that technical back-stopping from higher levels is non-existent makes this issue serious.

2) The culture of management, aggravated by dual control from DOF and the ***uppazillas,*** makes it difficult to expect that similar efforts can be replicated.

If these concerns can be addressed, we would have come a long way in enabling a self-reliant extension system for fisherfolk development in coastal areas of Bangladesh.

Targets 1992

- Consolidation of revolving funds and pilot projects.
- Orientation workshop on the subproject for ***uppazilla*** chairmen (DOF).
- Orientation workshop for DOF and NGO staff on Fishery Resource Management.
- Organization of national fisheries extension consultation in cooperation with DOF and DANIDA.
- Promotion of national follow-up project identified in 1990 under Development Support.
- Documenting the learning from the project.

Subproject : Extension Services for Small-Scale Fisheries in Ranong, Thailand (EXT/ESR/THA)

OBJECTIVES	Development and testing of a model for an improved extension service to enable integrated fisherfolk development. The subproject is aimed at small-scale fisherfolk in the province of Ranong, Thailand. It is hoped that the subproject would serve as a model for integrated fisheries and fisherfolk extension services in coastal provinces of Thailand.
STATUS 1990	The subproject started in 1987 by undertaking surveys in 55 coastal villages to better understand the status of fisherfolk, their needs and concerns. Costs and earnings studies of common fishing practices were conducted to supplement credit needs analysis. A problem census undertaken in three target villages formed the basis for pilot schemes, established with cooperation from other government agencies. These give fisherfolk access to social services. Subproject activities can be broadly classified into: adapting, demonstrating and extending fisheries technologies; facilitating credit; income generating activities for women; enabling fisherfolk access to social services provided in cooperation with other agencies; and, of course, learning about extension while doing all this. In the area of technology extension, the subproject has overcome the growout problems of oyster ***(Crassostrea)*** by choosing proper sites which are not affected by salinity fluctuations caused by freshwater drainage. But the availability of spat continues to be

a problem. Fisherfolk have been trained in spat luring and trials conducted to determine spatfall location and seasonality, but the number of spat so found will not allow expansion of culture in any significant scale.

Crab traps were successfully introduced after some initial problems in extension, but the subproject is concerned about the crab resources in the area and is hesitant to promote the technology, though fisherfolk are spreading the technology on their own.

Other attempts in the field of technology extension i.e. culture of mussel, oyster ***(Succrostrea)*** and shrimp in cages, and fattening of crab, have all failed for such reasons as lack of seed, marketing problems, high salinity fluctuations, etc.

With regard to credit, finding no institutional sources for funds (without collateral), the subproject resorted to setting up village-based revolving funds. However, the sustainability of such schemes, without continuous supervision, remains to be ascertained.

Women in selected fishing communities were provided skill training, in fish preservation, manufacture of fish-based products, sewing and crochet, in order to enable them to enhance their incomes and to reduce household expenditure. Health services and health education was provided, particularly to women and children in remote fishing villages, with the cooperation of the Health Department.

Project staff have been trained in extension methodology and technical fisheries matters. Several study tours have also familiarized them with similar efforts in the region.

With the end of the project nearing, efforts were begun, using consultants, to extract the learning from the project which would guide future attempts to provide integrated development and extension services to coastal communities.

Targets 1991	*Achievements*
Finalize documentation of learning from subproject and develop extension guidelines for small-scale fisheries	Consultants from Silaprakorn University undertook initial documentation of the process and learning. However, the report was more on evaluation than a process/learning documentation, and will have to be built upon with further work. Project staff have completed documentation of chronologies and learning, activity by activity. A draft compilation of the learning is ready and is being circulated for comment.
Discussion/ orientation for senior DOF staff on subproject learnings	Not done. Awaits finalization of documentation of learning and will be undertaken in 1992 in a series of workshops.
Oyster ***(Crassostrea*** sp.) spat luring trials in Kapoe Bay	Approximately one year's data on trials of spat luring using bamboo stakes and motorcycle tyre rafts in two locations in Kapoe and one in Muang District were collected. Spat luring was found to be economically feasible using bamboo stakes and m/c tyre rafts in one location. However, the production may not be sufficient to support culture at any significant level.
Fisherfolk organized to undertake marketing of oysters	***Crassostrea*** sp. : Project facilitated contacts between fisherfolk groups and Ranong customers. Fisherfolk are handling the marketing on their own. The demand is high and prices good.

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Saccrostrea sp. : Use of oyster was promoted in restaurants in Ranong. The customer demand is poor. Off season demand from traders continues to be low due to availability of the species nearer to the market in other regions.

Economic analysis of spat luring, culture and marketing of oyster (C. sp.) in Ranong

Economic analysis of spat luring completed. Analysis of economics of culture and marketing are in process. Results expected early in 1992.

Inputs to fisherfolk for improved management of revolving loan funds

Groups trained in book keeping by Agriculture Department. Close follow-up, on-line training and problem solving has built up fisherfolk confidence and has improved the performance of the funds. Repayments are at ***80% (See Bay of Bengal News No. 42).*** A leadership and group management training had to be postponed due to inavailability of trainers.

Infrastructure development in selected villages with fisherfolk participation and contribution :

- access road to oyster culture site in Kao Nang Hong

Villagers have completed a 200m road using materials bought from grant funds from project.

- water storage tanks in Kor Sin Hai

The tanks have been designed with support from Irrigation Department. The construction will take place in 1992 in order to utilize upstream water storage being built by Irrigation Department.

- water tanks in Kor Lao

Three tanks in the ground, using prefabricated well-rings provided by the project, were constructed by the fisherfolk and are in use.

- fishing pier at Km 70

Villagers opted instead for a rest-cum-guard house for their oyster culture site. Constructed by villagers using materials supplied by the project.

Unscheduled

A crab resource study was undertaken in the province by monthly sampling of catch rate, size, maturity and species. Analysis is yet to be completed.

20,000 oyster broodstock from Surat Thani were introduced into Kapoe Bay to enhance spatfall in the area.

With cancellation of the main phase of the UNFPA-supported project, the women's activities planned for were incorporated into the project. Training in the following skills was provided to women to enable improved household consumption and income generation :

Macrame	–	28 women
Hair-styling	–	13 women
Batik	–	13 women
Book-keeping and accounts	–	11 women
Sewing	–	18 women
Village stores (establishment and management)	–	2 women
Fish processing	–	351 women

Four women's groups have been established. Twenty women have been trained to act as health volunteers. Fifteen women were trained in nutrition and cooking practices for lactating mothers.

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Project staff were trained in batik production (2), handicraft production using grass and reeds (2), fish processing (4), and in the management of village stores (2).

Training in nutrition and cooking was provided, on request, to 12 teachers and 128 school children.

(Also see ***Bay of Bengal News No. 44.)***

Assessment

Extracting the learning from the project, given the preoccupation with day-to- day extension work, proved difficult and time-consuming, but, nevertheless, valuable. The readiness of a technology can, and does, affect the success of extension. This seems particularly important in aquaculture technologies, which require developmental work to tune them into local ecosystems. In turn, this raises the questions of technical expertise amongst extension staff to do it, the availability and access to technical backstopping and whether it should in the first place, form a part of extension. Time and again the resource implications have come up to constrain the extension of technologies and more training is necessary in order to equip extension staff in dealing with resource assessments and in communicating and enabling resource management amongst fisherfolk.

Income-generation activities of a non-fishery nature, particularly by women, are possible to extend, but while creating savings at the household level by providing consumer items, they often do not generate incomes as expected, because of difficulties faced by women groups in marketing the small quantities they produce in often distant markets against quality competition.

The learning of strategies and methods aside, an important question that will have to be considered, given the present small staffing and narrow expertise profile of provincial fishery offices, is the organizational and skill requirements to replicate activities successful in other provinces.

The discussions of the learning with the DOF in the last year of the project will, hopefully, give direction to extension efforts aimed at providing integrated development to the coastal regions of Thailand.

Targets 1992

- Finalization of documentation of learning.
- Sharing of learning from project with DOF staff in workshops.
- Training and support to women's groups in income-generation.
- Phasing out of BOBP support March - September 1992 and handover to DOF/PFS.

Subproject : Improved Earnings of Small-Scale Coastal Fisherfolk, Indonesia ***(EXT/IEF/INS)***

OBJECTIVES	To improve the earnings and socio-economic status of fisherfolk in coastal communities through improving their managerial capacity by emphasizing group action. The target groups are small-scale fisherfolk in coastal villages of the Langkat District of North Sumatera Province.
STATUS 1990	The subproject, originally intended to demonstrate an institutional credit system, changed focus because participatory studies during the preparation showed that an informal credit system already existed and was capable of meeting fisherfolk needs. The focus shifted to

improving the managerial capacity of fisherfolk by emphasizing collective action.

The subproject, with assistance from an NGO, Bina Swadaya undertook group mobilization and training of groups in group management and selection of enterprises. The effort showed that groups, when well formed, can be cohesive and accelerate into enterprise development. The staff of the PFS and Extension Services were trained by Bina Swadaya and became capable of group formation, group management and assisting groups in selecting enterprises. Methods and training materials were developed as part of this training. The six groups formed functioned well, started mobilizing savings, selected enterprises, initiated the enterprises and were actually using their collectivity to address other felt needs. However, the fisherfolk, in order to apply their knowledge and learning, needed inputs of information about enterprise options in a wide range of fishery and non-fishery areas, as well as economic information about these enterprises, to enable decisions to be reached. They also needed inputs, like technical training, to take up enterprises, and training in management enterprises.

The development of viable economic enterprises by the groups was slow for several reasons :

- The intensive pressure on fishery resources makes it difficult to come up with sustainable new fishery enterprise options;
- The fisherfolk themselves are limited in their search, through lack of experience and knowledge;
- The PFS and cooperating agencies are not sufficiently equipped to feed technical and economic information about potential enterprise options or to provide the technical inputs needed; and
- despite regular saving, the groups were not able to accumulate sufficient capital for their enterprises, and were also not able to get informal credit for non-fishery enterprises, as had been expected.

The result was that the groups started to lose enthusiasm.

Targets 1991	*Achievements*
Review of fisherfolk group formation and performance	Undertaken by a national consultant from the University of North Sumatera, assisted by a BOBP sociologist (See ***Bay of Bengal News*** No. ***42).***

It was found that the six groups (three men's and three women's, in three villages) were still functioning well, with a fairly stable membership of 89 women and 51 men. Their continued existence would, however, be dependent on their ability to expand their economic activities.

Extension of credit (in the form of revolving funds) for specified activities was recommended.

Further, it was stressed that more and better technical and managerial support should be given to the groups.

Training of fisherfolk groups in improved management of enterprises	Feasibility studies of the economic activities were carried out by technical experts from Provincial Agricultural and Fisheries Services, and the Department of Cooperatives. On-line technical training, including regular follow-up, was given to the six groups in their respective activities rearing of goats, cows and ducks for the women's groups, and boat engine maintenance and repair, management of a kiosk, and diversification of fishing gear for the men's groups. Further, training was given to the six groups, by extension staff from a local savings bank (BRI, SIMPEDES), assisted by project staff, in management of funds, cash-flow calculations, and the general issues of banking. On the request of the groups themselves, exchange visits are being arranged for sharing of experience on general and technical matters. Specifically, goat-rearing is creating general interest.
Training manual by which improved management of small enterprises can be demonstrated	Not done. Suitable resource persons to produce the manual could not be identified.
Credit support for fisherfolk group enterprises	Based on the feasibility studies, credit (in the form of outright grants, to be converted into group revolving funds) was extended to each group, according to needs, for their enterprises. Rules and regulations for use of the funds, repayments etc., were set up by the groups in discussion with the project staff. Each group collectively signed an agreement to repay the loans to their own funds, which have been deposited at a local savings bank. The repayments except in the case of the groups involved in fishery enterprises, is good and on schedule.
Staff trained in opportunity analysis to feed fisherfolk with information on enterprise options	Not done, because of difficulties in identifying qualified national trainers and because of time constraints on the part of the trainee staff.
Assessment of usefulness of manuals operated by the subproject and initiation of their dissemination and use	The training manual for group formation, prepared by Bina Swadaya in connection with the pilot activities in 1989, has been distributed to relevant persons in Indonesia and Malaysia with a request for comment. DGF, Jakarta, has given suggestions for modifications, and has expressed interest in having the manual (BOBP/MAG/7) printed and distributed to extension staff.

Assessment

It is still too early to finally determine the viability of the economic activities. However, the three women's groups are progressing very well, and are expected to get fair earnings – illustrated by the fact that goat- and duck-rearing is being replicated by other villagers.

The activities of the men's groups have so far only met with limited success, particularly the two related to fishing, as catches have been exceptionally low this year. The group running a shop is facing problems getting products at competitive prices, and have invested in goat-rearing to bolster their earnings.

An encouraging aspect is the fact that all groups, including the ones facing difficulties, are cohesive and have stable membership. The repayments to the group funds are on schedule, except in the case of the one group engaged in diversification of fishing gear.

The inputs as regards credit support, training and follow-up have been well timed and are well suited for the needs of the groups. The Agricultural (animal husbandry) Service, in particular, has been enthusiastic and interested in supporting the fisherfolk.

However, the question remains as to the replicability of the methodology used by the DGF, considering the high demands of inputs required for motivation campaigns, group formation, savings as credit support and support for technical and extension services – inputs that are envisaged to be crucial factors in determining a positive outcome.

Targets 1992

- Printing of training manual.
- Training of project staff in improved management of small enterprises.
- Consolidation of group enterprises, by improved management of enterprises and revolving funds.
- Analysis and reporting of project.

BRA CKISHWA TER CULTURE

The work under this discipline has focussed on

(a) two subprojects, in West Bengal (India) and Bangladesh, designed to demonstrate nursery rearing of shrimp and prawn seed to landless peasants engaged in collection of such seed and to demonstrate hatchery technology for the production of shrimp and prawn seed,

(b) small-scale oyster culture in Malaysia, and

(c) organization of a regional seminar on 'Mud Crab Culture and Trade'.

The nursery rearing trials of seed in cages, of both freshwater prawn and tiger shrimp, in West Bengal and Bangladesh indicate that this might be a seasonal economically-rewarding occupation for seed collectors. The viability has been demonstrated by a few participating family units in West Bengal. And, as a result, new participants have expressed interest and taken up the activity. In Bangladesh, however, the trials were disrupted by the severe cyclone in April, where the cages were destroyed and swept away by the tidal wave.

The technical feasibility of rearing freshwater prawn larvae using a brine-based recirculating system has been demonstrated in Bangladesh. Several problems connected with water quality and brood stock and other unknown factors have, however, resulted in very high mortality of larvae and juveniles. Commercial production and economic viability remain to be demonstrated.

A small-scale, or 'backyard' hatchery, primarily for tiger shrimp has been constructed at Digha, West Bengal. The completion was far behind schedule and initial trials were scheduled for December 1991.

The oyster culture development on the west coast of Malaysia has advanced during the year to such-a level that it is considered ready for commercial expansion. But the local spat collection has not been successful and commercial culture will have to be based on supplies of spat from the east coast and, in the long term, on spat produced by hatcheries. The latter technology has recently been significantly developed by the Fisheries Research Institute and the Science University. A key factor in the marketing of oysters has been the introduction of small-scale depuration units.

The mud crab seminar produced an up-to-date picture of taxonomy resource assessment, culture and trade in mud crabs in the region. An important issue for the future is resource management and there is a challenge to develop technologies for seed production and culture of crabs, suitable

for the small-scale sector. A regional cooperative development programme might be an appropriate subject for the third phase of BOBP, since it is of interest to all countries (except Maldives).

The work on seed nursery rearing and hatcheries in Bangladesh and West Bengal will be continued during 1992. It is hoped to better assess the viability of the technologies during the coming season, but there are many uncertain factors. It is therefore unlikely that the objectives will be achieved before the end of the project and further work is required. Wherever viability can be demonstrated, efforts will be devoted to preparation of extension material. An attempt will also be made to stimulate hatchery development in India, by providing training to private sector, small-scale entrepreneurs.

In Malaysia, the work during 1992 will concentrate on expanding the commercial culture, by providing extension support and seed money to small-scale culturists, and on preparation of extension material. It is anticipated that the objectives will be fully achieved and the subproject terminated before the end of the year.

Subproject : General Services (BWC/GEN)

Targets 1991	*Achievements*
A pre-feasibility study of mariculture options in the Maldives	Cancelled due to shortage of staff time. Studies on giant clam and sea cucumber, undertaken under the national UNDP/FAO Reef Fisheries Survey project, may serve as background material for future mariculture studies.
Study tour for Indian fisheries officials to Thailand and the Philippines	Done. A two-week tour was organized for three senior officials. A positive outcome was an increased awareness of the potential of small-scale, or "backyard", shrimp hatcheries, which is being followed up under BWC/SSS/IND.
A regional consultation on mud crab culture	A seminar was held in Surat Thani, Thailand, 5-8 November 1991. Fiftyone participants presented 3 1 papers on the taxonomy, culture, resource management and trade in the mud crab. A report on the seminar will be published in the Bay of Bengal News No. 45, while the papers will be published as seminar proceedings during the first half of 1992 (BOBP/REP/51). Prior to the seminar, reviews of the resources, exploitation, culture and trade were undertaken in all countries, except Maldives, by national counterpart officers or through national consultants. The papers served as background material in the seminar.

Targets 1992

- Publication of proceedings of mud crab seminar

Subproject : Shrimp Seed Supply, India (BWC/SSS/IND)

OBJECTIVES	Introduction of methods and techniques to increase the supply of shrimp seed and the income of seed collectors in West Bengal. Landless peasants engaged in shrimp seed collection in the semi-saline zone of West Bengal constitute the primary target group. Any hatchery development will, of course, not directly benefit this group,

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but is considered of indirect benefit, since it will ultimately help to preserve the natural resources.

STATUS 1990

The subproject started in 1988. One village in the Midnapur District of West Bengal was selected for trials of nursery cage culture, while Moynapara in 24 Parganas was selected for nursery pond pilot activities. Disputes over land and participant selection prevented implementation of nursery pond trials. The pond complex constructed under the project had to be abandoned.

During 1990, the basic techniques for tiger shrimp nursery cage culture were established in cooperation with fisherfolk families, but the first nursery attempts were not successful.

A survey of shrimp seed by-catch was initiated in cooperation with CIBA.

A feasibility study of a hatchery for penaeid shrimp at Ramnagar had been undertaken with the help of a Thai consulting team. Constraints related to the availability of power, water quality and staff transfers prevented the materialization of the hatchery. Instead, a study tour for DOF staff in 1990 led to the design and construction of a small-scale hatchery at Digha.

Targets 1991	*Achievements*
Complete seed by-catch study	Done. Results to be analyzed and published by CIBA.
Train NGOs in nursery rearing technology.	Not done due to lack of response to inquiries directed toward NGOs working with fisherfolk.
Evaluate economic and social feasibility of nursery culture in cages.	Cage culture can be a viable seasonal activity for fry catchers. The investment cost for a family cage unit is IRS 3,680, with an estimated internal rate of return of 33 per cent (Buy of Bengal News No. 43).
Complete one season's trials with lurelines.	Four trials were conducted with good results. Catches depend entirely on the lunar phase. One participating family has taken up use of the lureline, but overall response is still low. Further trials and demonstrations are required.
Construction of a demonstration hatchery at Digha.	Done, but the construction was completed nine months behind schedule. Twentyfive tons of brine are in stock, which will enable trials for tiger shrimp to be undertaken during the 1991-92 season (December - April).
Train DOF staff in hatchery operation	Digha staff were trained in techniques of freshwater prawn larvae culture in the existing experimental hatchery.

Assessment

Nursery cage culture can be profitable and the number of participants should be increased in the Midnapur District. A phased development may be undertaken wherein new sites would be tested for at least one season, and, if found technically and socially suitable, wider extension to the fisher-folk community in the area of the test site could proceed. Cage culture technology was easily adopted by seed collectors in Ramnagar on a household basis. An analysis should be made by an independent rural sociologist to identify potential problems should there be an expansion of cage culture.

With the completion of the hatchery at Digha and storage of 25 t of brine, rearing trials for *P.monodon* should be possible from December. The high rate of staff turnover in the hatchery is of particular concern because it negates training inputs.

With only one season left and many uncertain factors it is not likely that the objectives will be achieved; further work will be required.

The study tour by three Indian officials (reported on under BWC/GEN) led to increased awareness of the potential of small-scale hatcheries. The request by the GOI to promote such development through involvement of the private sector should be met.

Targets 1992

- Evaluation of the market for shrimp juveniles produced by nursery cage culture.
- Assessment of technical and economic feasibility of lurelines through field trials and demonstration.
- Publication in Bengali of extension manuals for nursery cage culture.
- Hatchery training for private sector, small-scale investors from Indian east coast states.
- Reporting.

Subproject : Shrimp and Prawn Seed, Bangladesh *(BWC/SPS/BGD)*

OBJECTIVES	Introduction of methods and techniques to increase the supply of shrimp/prawn seed and the income of seed collectors. The primary target groups are the many landless peasant families engaged in shrimp/prawn seed collection in the semi-saline zone. An important secondary concern is the national interest in the best utilization of the country's resources.
STATUS 1990	The subproject started in mid-1989 and the work got underway in 1990. Tiger shrimp nursery cage culture trials were initiated at Mognamapara, Chokaria, with the selection of participants and the design and preliminary testing of the cages. Freshwater prawn nursery cage culture trials using the same cage design, were started at Potiya, Chittagong. Seven government and private sector participants were trained in Bangladesh in prawn hatchery technology, followed by a study tour to Thailand. Construction of the freshwater prawn hatchery was completed at Potiya, but too late in the year to begin technical trials.

Targets 1991	*Achievements*
Establish feasibility of hatchery	The technical feasibility of using brine to make rearing water and the use of a simple recirculating system were demonstrated. Production has to be increased to reach profitability.
Construct one additional freshwater prawn hatchery, depending upon results from the first hatchery	Not done. Criteria for a second site were established and preliminary surveys made in the Dhaka area. However, profitability should be demonstrated before a second hatchery is constructed.

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Establishment of socio-economic feasibility of nursery cage culture	Not achieved for tiger shrimp due to cyclone damage (Buy ***of Bengal*** News No. 42). Preliminary analysis of the freshwater prawn nursery cage culture indicates that the technology is economically viable.
Training for government staff and private sector in freshwater prawn larvae culture	Not done for government staff. The freshwater prawn larvae rearing season partly overlaps the carp hatching season, preventing the FSMC staff from participating in hatchery trials. Only two persons from the private sector were trained.

Assessment

The acceptance of nursery cage rearing technology by fisherfolk has been encouraging. Although costs and earnings data are preliminary, it seems to be profitable. One problem that will arise as culture expands is natural feed availability. Artificial feed produced in Bangladesh was tested with satisfactory results. The participating NGO has effectively motivated and organized village participants and has undertaken ancillary development activities with its own funds.

The initial trials of the freshwater prawn hatchery experienced high mortality of larvae, particularly during the early part of the season. Some of the causes were identified, but more experience in managing operations, and particularly brood stock supply, is required. While the technical feasibility of the brine-based, recirculating hatchery system was demonstrated, production has to be increased to achieve profitability. A second hatchery should not be constructed until profitability can be demonstrated. The lack of participation of local fisheries department staff in hatchery activities will make it impossible to transfer the technology to the department.

Targets 1992

- Training courses for government and private sector staff in hatchery technology.
- Demonstrate socio-economic feasibility of nursery cage culture.
- Extension manuals in Bangla for nursery cage culture.
- Construction of commercial hatchery.
- Reporting,

Subproject : oyster Culture, Malaysia *(B WC/O YS/MAL)*

OBJECTIVES	Introduction of small-scale oyster farming as an income-generating activity for coastal fisherfolk on the west coast of peninsular Malaysia.
STATUS 1990	The subproject was initiated in 1988. Various culture technologies were tested and the most promising selected for further development and refinement in 1989 and 1990.
	BOBP withdrew support for flat oyster culture (O. ***folium)*** development on Langkawi Island; marketing and management problems were too difficult for participating fisherfolk to handle; spatfall was also too limited in space and time for commercial culture.
	Local availability of spat (Crassostrea sp.) at two sites on the west coast continued to limit production. Nursing systems were developed for hatchery spat although supplies from that source were very small.

	Trials with transplanted spat from the east coast indicated technical feasibility. Bacteriological sampling of oysters from the culture sites was initiated. Training courses were held for extension staff and fisherfolk.
Targets 1991	*Achievements*
National oyster culture seminar	Held in February with participation of DOF administrators, biologists and extension agents. Resource persons from Thailand also attended. Recommendations for technical and legislative action were published in the proceedings put out by the DOF ***(See Bay of Bengal*** News No. 42).
A routine programme for bacteriological monitoring at culture sites	Sampling was undertaken only sporadically.
Demonstration of commercial depuration technology	A small depuration unit was demonstrated at several promotions and two of these units have been given to participating fisherfolk in Kedah and Perak. The use of these units ensure the sanitary quality of oysters, enabling them to be marketed at any time.
Expanded fisherfolk involvement through visits and training courses	Exchange visits have been undertaken between participants, but no new fishermen had come forward until a series of exhibitions and promotions was launched. These exhibitions stimulated considerable interest among both consumers and fisherfolk. State fisheries personnel and FRI staff in Trengganu and Perak are following up with technical assistance. Training courses were held in March and November for fisherfolk and extension agents.
Further improvement in spat collection techniques	The quantity of spat collecting cultch has been increased at proven sites, but spatfall is still insufficient to ensure adequate stocking of growout units. Hatchery production of spat at the FRI facility has improved significantly. Through November, an estimated 5 10,000 spat had been produced and sent to participating farmers. Nursery methods have been developed for hatchery-reared spat which have survived and grown well. Asbestos plate counts of newly settled spat have been introduced to corroborate eyed larvae counts. Four transplants of C. ***iredafei*** totalling 200,000 spat, were successfully completed. When transported by refrigerated van, survival is no less than 90 per cent. The economics are highly favourable, since the average spat price is M$0.08, while the farmer's price for marketable oysters is M$0.30 to 0.70. Transport cost from the east to west coast is less than M$ 0.01 per spat.
Refinement of culture systems to reduce costs	Simplification of raft design and construction has reduced the unit cost by 48 per cent. Longlines have shown little wear after two years of use; the materials used are probably the best available choice.
Development of marketing strategies	Six promotions and exhibitions were held and were excellent means of developing consumer interest in cultured oysters. Brokers and restaurateurs have inquired about supplies from the subproject. The

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introduction of small-scale depuration was seen as a significant element in opening up the market. The participating farmers have established sales agreements with seafood restaurants and hotels. By year-end, sales had approached M$ 20,000.

Assessment

Local spat collection has been insufficient to supply existing growout operations. Unless new sources are found, west coast spat production will not be able to supply an industry, should it develop. However, with the establishment of an alternative spat source on the east coast of peninsular Malaysia, commercial development can proceed. The very encouraging increase in spat production from the FRI hatchery and the anticipated output from the IDRC-supported facility at the Science University of Malaysia augur well for the future development of a hatchery source of spat.

The introduction of small scale depuration is of crucial importance and could have an impact on other bivalve culture businesses, such as the cockle.

Promotional activities during the year received very good responses from the press and public. The promotions led to sales agreements between subproject participants and customers, which should accelerate the commercialization of the technology. Consumers expressed a clear preference for the east coast species, which implies spat must either be transplanted or produced in the hatchery. Increased effort is needed to interest other fishermen in taking up culture on the west coast. An inventory of potential west coast culture sites should be done to stimulate further expansion.

Targets 1992

- Extension and credit support to ten new farmers.
- Evaluation of training courses for fisherfolk and extension staff and conduct of one more course, if and as appropriate.
- Publication of extension materials.
- Economic assessment of culture.
- Reporting

FISHING TECHNOLOGY

Most of the effort during 1991, has been devoted to further implementation of subprojects already in progress i.e introduction of outrigger canoes in Sri Lanka and Indonesia, and demonstration of offshore fishing for large pelagic species and flyingfish in India. In addition, significant inputs have been provided for the development and demonstration of new liftable propulsion systems with inboard diesel engines for small craft in India and Sri Lanka. A minor activity has been the assessment of the merits of alternative boat-building materials.

The subprojects for outrigger canoes in Sri Lanka and Indonesia appear to have reached a certain level of sustainability. After the successful testing of canoes in previous years, some commercial development has taken place during the reporting year. Carpenters trained during construction of prototypes have built new canoes on a commercial basis for small-scale fishermen. This has been facilitated by banks, which have come forward and provided the necessary credit. The ideas and concepts of the new canoes have also been adopted by small-scale entrepreneurs and boatyards not directly involved in the subprojects; similar canoes have been built and put into operation. There is scope to introduce the new canoes in many other fishing villages. Such expansion may not happen automatically, but may need further extension inputs from the agencies concerned. From a BOBP point of view, it is considered that the project's objectives have been fully met.

Fishing trials for larger species of flyingfish off the Coromandel Coast were based on indications that they were available in commercial quantities during the period March to August. The results of the trials indicate that the availability is not consistent and the season might be considerably shorter than anticipated. Despite economic viability during short periods of high availability, further exploratory efforts might not be justified, as the benefits are not likely to be substantial. Considering the experience of kattumaram fishermen exploiting the smaller varieties of the flyingfish, it is believed that the fishery will develop by itself, as and when better craft, such as BLC and similar craft, become more common.

One year of commercially-oriented exploratory fishing for large pelagic species in the southern areas of India has been completed. Although it has been an exploratory exercise, including with it significant elements of in-service training of fishermen, the operation has been marginally viable in economic terms. Areas of concern are the relatively low prices of shark and, particularly, tuna, the moderate catch rates and the hesitation of fishermen to go far offshore and stay out more than one to two days. A similar operation from Madras is contemplated; both prices and catch rates, particularly of shark, are likely to be higher in this area, and the fishing areas are likely to be reached in shorter time at lower cost.

One of the reasons, and perhaps the reason, for the slow development of beach-based fisheries is the problem of motorization of the craft. Conventional inboard installations do not work in most places because of the protruding skeg, shaft, propeller and rudder. Outboard motors (OBM) have, to a certain extent, been a solution, but only of an intermediary nature because of the high cost of OBM (imported) and operation (high consumption of kerosene/petrol). A concerted effort is therefore being made to introduce liftable propulsion systems suitable for diesel inboard engines. It is a further development of the concept used in the BLC. It has been tested and demonstrated in outrigger canoes in Sri Lanka, plywood canoes in Kerala, nava in Andhra Pradesh and BLC in Madras. The work is being done in close cooperation with boatyards and engine manufacturers. The progress has been very satisfactory and it is hoped that reliable solutions will be found in 1992.

The studies on alternative boat-building materials in India (for kattumaram) and Bangladesh indicate that wood is still a very competitive material, partly because of the high duties on raw materials for FRP.

The proposed workplan for 1992, with the exception of offshore fishing trials in India, aims at completing all direct BOBP involvement in field activities well before the end of the year and handing over responsibilities to counterpart institutions. The remaining work will mainly deal with some further demonstrations, preparation of extension material and reporting.

Subproject : General Services (FIT/GEN)

Targets 1991	***Achievements***
Impact evaluation of introduction of BLC in India	Done. The findings in the draft report are that there has been a stagnation in the introduction of BLC due to the non-availability of engines, reduced catch rates in inshore areas and the high cost of the craft. Considerable indirect impact due to the BLC development has been identified.
Consultation on small craft development in India	Postponed till 1992 and proposed to be a regional consultation.
Video documentation of BLC introduction in India	Not yet completed.
Consultation on small-scale squid fishing	Cancelled. After careful consideration it was concluded that such an activity would not be relevant for the small-scale sector.

Reappraisal of building materials for *kattumaram* in India	Done. The findings are that logs are still the most cost-effective material available for *kattumaram* and will continue to be so for years to come. Of the alternatives recently tried out, FRP is the only feasible material for construction of large *kattumaram (teppa);* despite higher cost, it is acceptable to fishermen.
Construction and demonstration of new inboard propulsion system with rubber bellows	Done. Four new liftable propulsion systems were constructed to suit different types and makes of diesel engines and types and sizes of craft. The systems were also extensively tested and demonstrated to fisherfolk. Considerable interest had been shown in this development by boatyards, engine manufacturers and suppliers, and fisherfolk in India, Sri Lanka and Indonesia.
Consultation on propulsion unit	A technical consultation on the development of small craft and their propulsion systems was organized in November in Madras. The consultation was very useful for the exchange of experiences and dissemination of information on BOBP's development work. It was attended by thirty participants from six countries. In addition, field visits have been arranged for Fisheries Officers (2) and fishermen (10) in India to observe the development of small craft and liftable propulsion systems. These were arranged to create an awareness of the potential use of the craft and propulsion systems and to facilitate their introduction.
Unscheduled	A study of merits of alternative boat-building materials was undertaken in Bangladesh. The outcome is that timber is still the most cost-effective building material for small craft in Bangladesh.

Targets 1992

- Multi-disciplinary regional consultation on introduction of small craft.
- Final reporting of BLC introduction in India.
- Liftable propulsion systems in India and Sri Lanka.
  - Finalization of testing
  - Demonstration
  - Extension material
  - Reporting

Subproject : Outrigger Canoes, Sri Lanka *(FIT/ORC/SRL)*

OBJECTIVES	Development and demonstration of new outrigger canoes as alternatives to the conventional ones, to increase earnings of fisherfolk, by reducing costs and improving efficiency, and to reduce waste of timber resources. (This subproject was earlier a component of the subproject "Fishing Boat Development" FIT/FBD/SRL).
STATUS 1990	Outrigger canoes of new design, made of wood and FRP, were tested and successfully demonstrated in Doddanduwa, a fishing village. Carpenters were trained to construct the wooden canoes and set up their own boatyard. Seven wooden canoes were built on a commercial basis by this boatyard for local fishermen. The FRP canoe, although

popular, was considered to be too expensive. Credit was mobilized for acquisition of the new canoes. The development generated interest in other villages.

Attempts to motorize the canoes by 'long-tail' diesel units failed, but 'liftable' propulsion systems, using inboard diesel engines, were developed and tested.

Targets 1991	*Achievements*
Technical and financial support to construct SRL-18A for interested fishermen in 2-3 new fishing centres	Six timber SRL-18A outrigger canoes were constructed in a commercial operation in Doddanduwa and Balapitiya. Credit was provided by local banks for the fishing gear and engines. Technical support was also given to the Hambantota Integrated Rural Development Project for the construction of one outrigger canoe for demonstration purpose.
Construction of two more FRP SRL-18A outrigger canoes for further demonstration	One canoe was built by Ceynor for inboard installation of a new liftable propulsion system. Another one was built by BSM boatyard for demonstration-cum-sale.
Testing and demonstration of an inboard liftable diesel propulsion system	The system, installed in an SRL-18 wooden canoe, has been fully tested in commercial fishing. As a result, two more propulsion systems of similar design have been constructed and fitted in two new canoes (SRL-18 and SRL-19) for demonstration in different fishing centres.
Demonstration of insulated ice box on board the outrigger canoes	Two removable insulated ice boxes have been built for demonstration. Though limited the trials suggest that boxes in outrigger canoes may improve the quality of fish and result in a higher price of the fish in some centres. In most cases, it will significantly contribute to the increase of duration of voyage, resulting in more fishing time, reduction in fuel expenditure and increased earnings. More promotion work needs to be organized.
Demonstration of hook and line fishing from outrigger canoes fitted with diesel engines	From November, trolling for small tunas and handlining for demersal species have been demonstrated with an SRL-18 outrigger canoe fitted with a diesel liftable propulsion system. From a fuel saving point of view, the trials are promising and are being continued.
Facilitation of credit for introduction of outrigger canoes	Arranged for fishing gear and engines for twelve wooden canoes and one FRP canoe. Outrigger canoes of both types have been included in a local bank credit scheme.
Preparation of extension and training material, pamphlets, slides, etc.	1000 pamphlets in Sinhalese on the development and introduction of outrigger canoes were printed and distributed. Slides and an audio cassette narrating the construction of the SRL-18 timber outrigger canoe have been completed. A Sinhalese version of a video film produced earlier, on the development and introduction of the outrigger canoe, was completed.

Assessment

The introduction of SRL-18 wooden canoes is well underway in Galle District and particularly in Doddanduwa, where more than ten outrigger canoes are in operation. Further inputs by BOBP

for demonstrations in the Galle District is not required. Trained field officers of the Department of Fisheries are capable of continuing the work. Extension effort should be expanded to other districts, such as Hambantota, where the same size of outrigger canoe are used. This includes the technology of constructing wooden canoes.

For small-scale fisherfolk to have access to these type of canoes, it is essential that credit is made available for craft, engine and fishing gear. A beginning has been made, partly in conjunction with the BOBP subproject 'Fisherfolk Credit' project (DEV/FFC/SRL), but more needs to be done.

The liftable propulsion system for inboard installation is working well and seems to be feasible. However, further trials are required to fully establish the reliability of the system before recommendations are made for larger introduction.

Targets 1992

- Introduction of wooden canoes in Hambantota District through subcontract arrangements.
- Finalization of the inboard liftable diesel propulsion system.
- Reporting.

Subproject : Flyingfish Fisheries, India *(FIT/FFF/IND)*

OBJECTIVES	Demonstration of flyingfish fishing with gillnets. The fisherfolk likely to benefit from the subproject are those operating larger ***kattumaram,*** motorized traditional craft, BLC and similar craft. Higher earnings and increased fish production from an under-exploited resource would be the end result.
STATUS 1990	The use of a specifically designed gillnet with a beachlanding craft (BLC) in Madras in 1988 revealed availability of large flyingfish species (non-spawner) in commercial quantities from March to August. Systematic fishing trials were intended during the 1989 fishing season but did not materialize until 1990. In that year, the trials were conducted from mid-April till end-July using a BLC. The feasibility of seasonal gillnetting of large flyingfish using motorized boats was demonstrated in Thirumullaivasal and confirmed the results obtained earlier in Madras, thus suggesting the availability of large flyingfish resources all along the Coromandel Coast. A utilization and marketing study of flyingfish in South India was carried out by the Post-Harvest Fisheries Project. It indicated that the market is receptive to flyingfish and that increased landings should not have significant negative impact on the prices. But deterioration of flyingfish before landing was of concern.

Targets 1991	*Achievements*
Commercial fishing trials of large flyingfish with motorized BLC and large ***kattumaram***	Done with motorized BLC in Thirumullaivasal from April to August. The availability of the large species was low this year. Only the small varieties of flyingfish were available in commercial quantities in June and July. Gillnetting for these species was viable with motorized BLC during those two months. (See ***Bay of Bengal News No.*** 41).

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	Because of high running cost of OBM *kattumaram* and better fishing opportunities in nearshore areas, gillnetting for large flyingfish failed with *kattumaram.*
Training of fisheries field officers	One Fisheries Officer of the Tamil Nadu Fisheries Department has , been trained in construction and use of gillnets for large flyingfish and is now well-equipped to extend this technology to the small-scale sector.
Fishing demonstration for fishermen and officers from other areas	Done, only for three Fisheries Officers from Thanjavur District.
Study of prices and demand of flyingfish in relation to other important species	Not done, because of the low landings of the larger variety.
Development of extension material	Not done. Expansion of flyingfish gillnetting, based on earlier work done in Madras, to other fishing villages along the coast where flyingfish are available suggests that there is no immediate need for extension material. An impact study of earlier trials for large flyingfish along the Coromandel Coast of Tamil Nadu, from Madras to Pondicherry, was carried out. It indicated that, even without an organized extension programme, the fishery expanded after the 1988 trials in Madras. Significant number of non-motorized *kattumaram* of several fishing villages along the coast are employing specially constructed gillnets or make use of modified Indian mackerel gillnets to catch large flyingfish in more offshore zones whenever fishing in nearshore areas is less profitable.
Analysis and reporting	A draft report has been prepared which will be published as a Working Paper (BOBP/WP/84).

Assessment

Results of gillnetting off Thirumullaivasal suggest that, areawise, seasonal availability of large flyingfish is uncertain and that gillnetting for this fish alone may not be feasible every season. It should be combined with small flyingfish gillnetting in combination with lures.

The feasibility of flyingfish gillnetting with motorized *kattumaram* is doubtful. The carrying capacity is too low, the running cost of kerosene OBM is too high and the preservation of the catch without ice is difficult. Though the fishing is possible with non-motorized *kattumaram,* it will only be carried out when and where other opportunities more nearshore do not exist.

The process of expansion of this fishery can be accelerated if further demonstrations are done. The Fisheries Department of Tamil Nadu has trained a skeleton staff to carry out such extension activities without support from BOBP. No further activities are, therefore, envisaged.

Subproject : Large Pelagic Species, India (FIT/LPS/IND)

OBJECTIVES	Demonstration of fishing for large pelagic species using driftnets and longlines. The intended beneficiaries are fisherfolk who operate BLC and similar, or larger, harbour-based boats. Successful implementation would lead to higher earnings and increased fish production from underexploited resources.

STATUS 1990	The subproject started in 1989 with the transfer of one boat (SRL-15) from Sri Lanka. The rationale was largely based on the experience of a similar fishery in Sri Lanka. Because of a major engine breakdown of the first boat, the fishing trials didn't take off until mid-1990 and a second boat was then added. The first few months of operation yielded some interesting results. Large quantities of seer-fish generated good earnings, but the catch of large pelagic species in the offshore and deep sea zones remain low.
Targets 1991	*Achievements*
Commercial fishing trials till at Ieast August	Done and extended till the end of the year employing the two boats. The boats performed well technically, but the fishing operations were not carried out sufficiently in offshore areas to harvest large pelagic species. One full year's cycle of operation suggests that this type of fishery is marginally viable but depends largely on a good seasonal catch of seer fish. Low prices for tuna and billfish species is of concern.
Inservice training of fishermen in operation and maintenance of offshore boats	Done, but not completed. Fishermen still lack the required experience to conduct consistent successful offshore fishing operations.
Reporting with recommendations for follow-up	A draft working paper (BOBP/WP/81) on one year of fishing trials has been prepared. In view of the limitations of the trials, no recommendations for long-term follow-up have been made so far.

Assessment

The SRL-15 boat type has proven to be technically suitable for the harvest of large pelagic species on a year-round basis. But the range of operation and duration of trips have been too limited (to the continental shelf area, 60 miles from shore, and to less than three-day trips). It has resulted in less access to large pelagic specie.

Despite adaptation of small-scale ftshermen to multiday offshore operations, there is still a need to develop the leadership of fishermen to ensure sustained, successful, offshore multiday fishing operations.

The results of the fishing operations indicated commercial viability. However, it depends too much on the catch of seerfish within 60 miles from the shore. With the present prices of other fish low, compared to seerfish, it is doubtful whether the catch rate of the former can be increased to the level needed to attain commercial viability. A larger introduction of SRL-15 type of boats cannot yet be recommended.

It is therefore proposed that the fishing operations be continued till the end of the project, but that they be conducted from Madras. There are good prospects for higher catch rates, particularly of shark, and the prices are likely to be higher in a metropolitan area. The offshore resources may also be available closer to the coast, at about 40 miles.

Targets 1992

- Twelve months of commercial fishing.
- Assessment of economic viability.
- Reporting.

(In addition, the Post-Harvest Fisheries Project will assist in developing the market for large pelagic species.)

Subproject : Outrigger Canoes, Indonesia *(FIT/ORC/INS)*

OBJECTIVES	Development and demonstration of plank-built outrigger canoes as an alternative to traditional fishing craft, in order to increase incomes of fisherfolk and production of underexploited resources. The target group are the fisherfolk of Nias Island, almost all of whom are small-scale operators employing small, traditional craft of limited capacity and range.
STATUS 1990	Of three prototypes of motorized outrigger canoes built in 1989, the two larger ones, 8.0 m and 9.5 m, were proven to be technically and economically feasible after nine months of continuous commercial fishing with hook and line in the northeast area of Nias. As a result, a final version, an 8.6 m outrigger canoe, was designed for subsequent introduction. A key factor in the success of the fishing operations was the introduction of insulated boxes for preservation of the fish on ice.

Targets 1991	*Achievements*
Technical and financial support for construction of a few new outrigger canoes in Gomo	Three new 8.6 m outrigger canoes (INS-5) were built for the fishermen of Gomo and Sirombu. One more canoe was then planned and built to extend training of carpenters in Sirombu. (See *Buy of Bengal News No. 43.)*
Training of local carpenters in outrigger canoe construction at village level	Four carpenters were trained in all aspects of the construction during the building of the first three canoes in Gomo and the fourth canoe in Sirombu.
Continuous monitoring of fishing operations of new outrigger canoes in Gomo and assistance as required	Reliable cost and earnings data were collected and analyzed. In-service training of fishermen in management of small enterprises, saving and maintenance of craft and engine was provided.
Assessment of access to financing schemes by small-scale fisherfolk	A pilot financing scheme featuring a loan amount of Rp. 2,500,000 at an interest rate of 26 per cent, with a guarantee of Rp 1,000,000 from the project for up to four outrigger canoes, was prepared in collaboration with BPDSU (a local bank).
Fishing demonstrations of existing prototype outrigger canoes in a 'new' village	Fishing demonstrations with existing canoes were continued in Gomo till new outrigger canoes were built and existing canoes were sold to local fishermen. The demonstration of the new outrigger canoe in Sirombu commenced mid November.
Transfer of prototype outrigger canoes to fisherfolk	The 8.0 m and 9.5 m prototype outrigger canoes were sold for Rp. 1,500,000 and 2,100,000 and transferred to small fishing entrepreneurs of the Gunung Sitoli area in northeast Nias.

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Field visits to Gomo by fishermen of other villages in Nias to get exposure to development of outrigger canoes	Four fisherfolk of Sirombu, on the west coast of Nias, and 13 fishermen of the Sibolga area on the west coast of North Sumatera Province visited Gomo.
Video films and slides	A video film on the development and introduction of the outrigger canoes was completed. Copies of the film were given to FAO, PFS and DGF for extension work elsewhere. A leaflet on the construction of the outrigger canoe at village level is being prepared.

Assessment

After successful testing and demonstration of new outrigger canoes, the subproject has entered into the introduction phase during the last year. The introduction of the first four boats is being facilitated by BOBP providing a bank guarantee. However, it seems that further introduction will not be dependent on such guarantee. The PFS is in the process of launching a scheme to introduce some 35 canoes, some of which are intended for Sibolga on the mainland of North Sumatera. A sign of sustainability of the results is that private, small-scale entrepreneurs have started to build similar canoes on their own.

Another positive outcome is that two groups of carpenters in Gomo and Sirombu are well trained in all aspects of construction of planked motorized outrigger canoes.

In view of the above, it is considered that the objective of the subproject has been achieved.

Targets 1992

- Demonstration of canoes in Sirombu till June 1992.
- Monitoring of savings and loan repayment of canoes in Gomo till June 1992.
- Transfer of outrigger canoes to fisherfolk.
- Information and extension material.
- Reporting.

DEVELOPMENT SUPPORT

The main areas of work during the year have been the implementation of the subproject for fisherfolk credit in Sri Lanka, preparation of project proposals and their follow-up in Bangladesh and Sri Lanka, organization of a regional training course and a consultation, and economic analysis of technology development in support of the technical disciplines of the project.

The Fisherfolk Credit Scheme in Sri Lanka, although much delayed, reached the take-off stage towards the end of the year. The turbulent conditions in Sri Lanka, particularly in 1988189, is one of the reasons for the slow progress. Another reason is that all the parties, i.e three banks and the Ministry of Fisheries, have been actively involved in all steps of the work. At the beginning of the subproject there was some distrust between the parties, particularly between the banks on the one hand and the Ministry on the other, due to the failure of past credit schemes. This had to be overcome. The resulting cooperative effort, facilitated by the subproject, is a major achievement. The fact that the scheme, through a long process of consultations, studies and training activities, has been formulated by the parties themselves and not by outsiders will ensure sustainability of the subproject.

The formulation and promotion of new projects has resulted in a final proposal for a marine fisheries management project in Sri Lanka to be funded by UNDP. Two project proposals in Bangladesh have been included in the Government's development plan. They concern marine fisheries management and socio-economic uplift of communities; the latter is a direct follow-up of BOBP's extension work under EXT/BGD/FED. The management projects are not directly related to BOBP's present efforts, but would be so in the third phase.

The training course on 'Project Formulation' and the Consultation on 'Planning' were, in themselves, useful exercises, but the impact is entirely dependent on the follow-up actions by the participants and their organizations. With regard to project formulation, BOBP's abilities to stimulate any follow-up is very limited. The recommendations of the planning consultation will be pursued, but it is of concern that the response from countries, after the Consultation, has been meagre, to say the least.

The economic analysis undertaken during the year, of technologies being introduced under Brackishwater Culture and Fishing Technology, have dealt with small-scale offshore fisheries and flyingfish fisheries in India, outrigger canoes in Sri Lanka and Indonesia and oyster culture in Malaysia. The reporting on this has been included under the respective disciplines and subprojects.

The areas of work planned for the coming year are the follow-up and promotion of project proposals in Bangladesh and India, finalization of the credit project in Sri Lanka, updating of General Descriptions of Fisheries, promotion of TCDC, identification of development assistance needs in Myanmar, and updating of economic analysis of technical activities.

Subproject : General Services *(DE V/GEN)*

Targets 1991	*Achievements*
Training in the preparation of projects	A four-week training course in Fisheries Project Formulation was organized in collaboration with FAO Headquarters (TCP) and SEAFDEC. The project sponsored the participation of 12 trainees and provided resource persons from its staff in all the disciplines.
Consultation on fisheries planning	A consultation on fisheries planning was held with the participation of two fisheries planning personnel from each country. It resulted in recommendations on (a) improvement of fisheries information at national and regional levels, (b) promotion of TCDC, and (c) closer inter-agency coordination in fisheries planning. A revised format for the updating of the General Description of Fisheries was agreed upon. It was also concluded that the monitoring of pelagic shark fisheries might be an area for regional cooperation. This should be discussed in the next AC meeting and followed up as appropriate under the Resources discipline. A list of areas/activities with high potential for TCDCs within the BOBP region was drawn up, and the Project offered to extend financial support for travel etc., when the member countries interact among themselves, and make the necessary arrangements. A brief information seminar on Coastal Area Management, to be held in conjunction with the 16th AC meeting, was contemplated but has been postponed till 1992.

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Comparative study of fisheries systems	In view of the similar work planned under the Bio-economics project, this activity was not pursued. But some preliminary work, sponsored by SIDA, was undertaken as a minor field study in Kakinada, India, by postgraduate students.
Updating of the fisheries information material	Updating of the General Descriptions of Fisheries in Tamil Nadu, Sri Lanka and Bangladesh commenced towards the end of the year according to the new format agreed upon in the above mentioned Consultation.
Follow-up of project proposals	The proposals for fisheries development to be incorporated in Sri Lanka's Country Programme were agreed upon. The formulation of the final proposal for marine fisheries management was completed with assistance of a consultant and BOBP staff. The formulation team was funded by UNDP. The three projects recommended earlier for marine and brackishwater fisheries in Bangladesh were accepted by the Government and included in the Rolling Development Plan.
Project identification	A project identification mission to Myanmar was planned, but had to be postponed. Assistance was provided to the formulation and implementation of a cyclone rehabilitation project in Bangladesh, financed by FAO under its TCP.

Targets 1992

- Follow-up of project proposals in India (offshore fisheries development) and Bangladesh (management of marine fisheries and socio-economic development of coastal communities).
- Identification of development assistance needs in Myanmar.
- General descriptions in Sri Lanka, Bangladesh and Tamil Nadu.
- Promotion and sponsoring of TCDC.
- Minor field study on crew remuneration system.

Subproject : Fisherfolk Credit, Sri Lanka (DEV/FFC/SRL)

OBJECTIVES	Introduction of a non-subsidized credit scheme under the banks' normal lending programmes for small-scale fisheries, fishery-related activities and other economic activities, in order to increase the income of fisherfolk and their families. The target group of the subproject is small-scale fisherfolk, particularly owner/operators of small craft, labourers and women from the fisherfolk communities in the districts of Puttalam. Galle and Matara who have no, or limited, access to credit.
STATUS 1990	Studies of socio-economics and economic activities of fisherfolk in the subproject area, which were started in 1988, were completed only

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in 1990, mainly due to the disturbed conditions in the country. Other preparatory studies undertaken in 1990 were :

(a) Inventory of existing fisherfolk-oriented credit schemes and their status,

(b) Cost and earnings of economic activities of fisherfolk by the bank officers; 37 small economic activities were identified for bank support in the project area,

(c) Analysis of training needs of bank branch and HQ staff to improve management and bank-client relationships,

(d) Improved strategies for credit marketing.

Training was provided to bank staff in economic and financial analysis of small-scale enterprises at two residential workshops.

An Inter-Agency Committee formulated a report which included a credit scheme, a credit flow strategy, a banking plan and monitoring mechanism.

Targets 1991	*Achievements*
Regular monitoring of the credit scheme and on-line refinement	The implementation of the Scheme, which was expected to commence in the second quarter, did not materialize before the end of the year due to delays in presentation of the Scheme to the banks and procedures involved in bank management approval. The Scheme was finally approved in the last quarter of the year and is ready for implementation from 1992. It comprises credit for fishing activities, fishing-related activities such as drying, curing and sale of fish, repair of craft, small-scale land-based economic activities, consumption, debt redemption and purchase/enhancement of assets. The terms and conditions of loans are as simple as possible, to enable the poorer sections to borrow. The lending will be undertaken by Bank of Ceylon, People's Bank and the Regional Rural Development Banks up to a maximum of Rs. 270 million (See Bay of Bengal News No. 44).
Training of bank officers involved in scheme implementation	Seventy senior level officers of the banks and the Ministry were given an orientation on the new scheme — middle level officers, branch managers, and fisheries officers were trained on the procedures and the operational arrangements of the Scheme.
Publicity programme	Not done, pending the approval of the Scheme.
Report on the scheme	A draft report has been prepared.

Assessment

Owing to the late approval of the Scheme by the Central Bank and the participating banks, the implementation could not commence in the early part of the year as envisaged. The subproject has led to a better and improved communications between the banks, fisheries officers and the fisherfolk, thus benefitting the fisherfolk. The Project Management Committee, which met regularly, developed into a very useful forum to discuss and resolve credit issues outside the purview of the BOBP subproject. As a result of the studies and investigations completed under the project, there is now a much better understanding and appreciation of the problems and needs of the fisherfolk.

The orientation programmes for the officers of the Ministry and the banks in the second half of the year proved to be very useful in providing a better understanding of the credit scheme in its implementation process.

Targets 1992

- Quarterly monitoring of the Scheme.
- Training of bank and Minfish officers in disbursement, monitoring and recovery of credit.
- Borrower eduction and savings promotion.
- A national seminar on the Scheme.
- Reporting.

ENVIRONMENT

The environmental aspects of BOBP's work are primarily covered by the new SIDA/SWEDMAR project 'Assessment of Pollution Hazards in Fisheries' and a more specific one, the 'Cleaner Fishery Harbours' project.

Another environmental concern, directly related to small-scale fisheries, which has recently grown in importance is the capture of dolphins, primarily in driftnets. In the BOBP area, this subject is of particular relevance to Sri Lanka, where it is reported that large number of dolphins are landed *(See Bay of Bengal News No. 44).*

A review of previous studies revealed that they had not been comprehensive and that they were deficient in one way or another; the estimated landings are in some cases believed to be exaggerated. The Government of Sri Lanka is seriously concerned about this environmental problem, as it is the small-scale fisherfolk who are economically dependent on the capture of dolphins. BOBP was therefore requested to undertake a one-year study, to cover seasonal variation, of both landings and marketing of dolphins and the socio-economic importance thereof.

The subproject entitled 'Dolphin Catches in Sri Lanka' ENV/DOL/SRL is being implemented by NARA with assistance from the Programme and guidance and supervision from the Fishery Biologist of its Bio-economics project. It started in the middle of 1991. The details are given below :

Subproject : Dolphin Catches in Sri Lanka *(ENV/DOL/SRL)*

OBJECTIVES

(a) Estimation of total number of dolphins caught in fisheries targeted and non-targeted on them.

(b) Assessment of economic importance of dolphin catches to fishermen/fisherfolk and consumers.

(c) Assessment of attitudes and perceptions of fisherfolk, traders, consumers and non-consumers to dolphin.

STATUS 1990

A review has been made of earlier studies of dolphin catches in Sri Lanka.

Achievements 1991

NARA has assigned seven field data collectors around the country, except in the North, two Research Assistants and a Supervisory

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Scientific Officer. Theoretical and practical training for the samplers was provided. A frame survey was conducted on the west coast and past records of catches were used for the east coast, to identify seven base stations with 14 sampling sites. All forms and questionnaires were prepared. The sampling programme commenced in September.

Objectives 'b' and 'c' were subcontracted to a marketing research bureau. A preliminary survey was conducted at six sites on the west and south coast in October.

Progress of work is being monitored in quarterly meetings with attendance of all parties concerned.

Assessment

The sampling programme is well underway and a few teething problems were resolved during the first quarter. There are, however, difficulties in monitoring the sampling on the eastcoast because of prevailing conditions; assistance of DFEO (Batticaloa) and Ministry of Fisheries personnel (Trincomalee) is being sought in this respect. Although there is no law against catching and marketing dolphins, fisherfolk are often harassed and threatened by police and security personnel. Fisherfolk in some places are, therefore, reluctant to report their catches and on marketing activities. This will effect the results of the study to some extent. The Ministry of Fisheries is, however, taking action to inform the police/security officers concerned.

Targets 1992

- Biological sampling to complete one-year cycle.
- Socio-economic and sociological survey.
- Review of information of capture of dolphins from other areas of the world.
- Analysis and reporting.

INFORMATION SERVICE

The Bay of ***Bengal*** News, BOBP's newsletter, continued uninterrupted publication during 1991. Not only was its growing popularity reflected in an increasing mailing list and several requests for copies, but the inflow of articles was also much greater, necessitating more pages per issue. Most of these articles, however, came from staff, or from associates working on BOBP, projects. There continues to be a paucity of articles from scientists and planners in member countries.

BOBP's Resources Project and Information Service trod new ground when they collaborated on a project with a difference aimed at the fisherfolk on the beach. A comic book on 'Our Fish, Our Wealth' – explaining how the resource could be protected through the cooperation of fisherfolk respecting a demarcation of particular fishing grounds for each type of craft – was produced in English/Tamil/Telugu. After a survey was made amongst fishing communities, bulk supplies of this comic book in Tamil/Telugu were to be distributed, to Adult Education groups, Non-Formal Education authorities and NGOs working with fisherfolk, to allow the publication and its contents to percolate down to the fisherfolk on the beach. The initial feedback of the publication has been encouraging, but a response from the fisherfolk themselves is awaited.

Fifteen reports, working papers and information documents were brought out during the year. Better use of photographs and charts were made in these publications and, for the first time, the publications included some colour printing. Of special interest were three documents that reported

on Socio-Economic Surveys. These featured the Status and Needs of Fisherfolk in the Meemu, Vaavu and Faafu Atolls of the Republic of Maldives, the Status and Needs of the Fisherfolk in the Fisheries Districts of Puttalam, Chilaw, Galle and Matara in Sri Lanka and that of the Fisherfolk of Nias Island, Indonesia.

Another highlight of the year was an exhibition organized together with the Alliance Francaise, Madras. This exhibition featured photographs in black and white and colour as well as the work of a few artists. The emphasis of both photographs and art was on the 'Fisherfolk of the Bay', particularly the small-scale fisherfolk. The exhibition aroused a great deal of interest and received excellent reviews (See Bay ***of*** *Bengal* News No. 43). Holding the exhibition in fishing villages in Tamil Nadu is now under consideration. The idea of a village level exhibition, after inauguration in major towns, could be considered for other countries in the Bay as well.

At the inauguration of the Exhibition, the problems of the fisherfolk were presented in dramatic form by a fisherfolk's dance-drama group who narrated their story in the traditional dance-drama form of Tamil Nadu — Therukoothu. The script of this dance drama (in English/Tamil) and a small brochure of the Bay of Bengal Programme was distributed during the Exhibition. During the week-long exhibition, video shows on BOBP's activities were also held daily.

The Information Service's own video unit, as well as video film makers on contract, have been made good use of during the past year and several films have been produced. The popularity of these films would appear to indicate that greater emphasis needs to be paid to this form of communication during the coming year.

Targets 1991	***Achievements***
Four issues of *Bay* ***of*** *Bengal News*	Done, totalling 116 pages.
Technical reports and manuals	Two reports, eleven working papers, one information document and a comic book were produced during the year, as follows :
	BOBP/REP/47 : Exploratory Fishing for Large Pelagic Species in Sri Lanka
	BOBP/REP/48 : Report of the Fifteenth Meeting of the Advisory Committee
	BOBP/WP/64 : Reef Fish Resources Survey in the Maldives
	BOBP/WP/65 : Seaweed (Gracilaria Edulis) Farming in Vedalai and Chinnapalam, India
	BOBP/WP/66 : Improving Marketing Conditions for Women Fish Vendors in Besant Nagar, Madras
	BOBP/WP/67 : Design and Trial of Ice Boxes for Use on Fishing Boats in Kakinada, India
	BOBP/WP/68 : The By-catch from Indian Shrimp Trawlers in the Bay of Bengal: The potential for its improved utilization
	BOBP/WP/69 : Agar and Alginate Production from Seaweed in India
	BOBP/WP/70 : Kattumaram Fisheries and Fisherfolk — A study in Kothapatnam-Pallipalem, Andhra Pradesh, India
	BOBP/WP/72 : Giant Clams in the Maldives — A stock assessment and study of their potential for culture

BOBP/WP/73 : Small-Scale Culture of the Flat Oyster (Ostrea Folium) in Pulau Langkawi, Kedah Malaysia

BOBP/WP/76 : A View from the Beach — Understanding the status and needs of fisherfolk in the Meemu, Vaavu and Faaful Atolls of the Republic of Maldives

BOBP/WP/78 : The Fisheries and Fisherfolk of Nias Island, Indonesia

BOBP/INF/12 : A Socio-Economic Survey of Fishing Communities in Sri Lanka (The Fisheries Districts of Puttalam, Chilaw, Galle and Matara)

BOBP/MAG/l0 : Comic book titled 'Our Fish, Our Wealth' (in English/Tamil/Telugu)

Desk calendar — Done.

Video films on subprojects — Eight films were produced during the year and three language adaptations of earlier films were made.

- Small-scale Fisherfolk Communities in the Bay of Bengal. (AV converted to video).
- Therukoothu — The traditional dance-drama form of Tamil Nadu (South India).
- New Outrigger Canoes of Nias Island, Indonesia.
- Post-Harvest Activities in South India, Distribution of Ice Boxes, Anchovy Drying, A New and Better Fish Marketing Container for the Retail Sellers (women).
- Manufacture and Use of Prawn Feeds in Aquaculture Projects in Kakinada.
- New Canoe for Sri Lanka (Sinhalese adaptation). (Produced by Worldview International Foundation.)
- Use of Ice Aboard Fishing Boats in Andhra Pradesh (Telugu adaptation.)
- Extension Activities in Ranong (English adaptation.)

Unscheduled — Extension pamphlets on Post-Harvest Fisheries activities

- A New and Better Fish Marketing Container (English/Tamil)
- How to Make High Quality Dried Anchovies (English/Tamil)
- The use of ice in navas (English/Tamil/Telugu)
- Permanent Ice Box — Construction Specifications (English/ Tamil/Bengali)

Audio tape on Fisheries Radio.

Targets 1991

- Newsletter ***Bay of Bengal News — 4*** issues (128 pages)
- Reports — about 20 working papers, reports and information documents
- Book reviewing BOBP's activities from 1979-1992

- Video films – about ten on various activities
- Various Post-Harvest Fisheries pamphlets
- Two new titles in BOBP's comic book series

PROJECT INPUTS AND THEIR UTILIZATION

The budgets and estimated expenditures for the three projects are as follows :

Project	*Budget 1991. us $*	*Est. Exp. 1991 us $*
GCP/RAS/ 118/MUL	2,114,230	1656641
GCP/RAS/ 117/MUL	–	94,097
GCP/RAS/ 126/AGF	150,000	153,393

(Further details are given in Table 1.)

Extension work accounts for about 26 per cent of the expenditure, Brackishwater Culture 20 per cent, Fishing Technology 23 per cent, Fishery Resources 3 per cent, Development Support 18 per cent and the Information Service 10 per cent. The costs of Fishery Resources which accounted for 13 per cent in 1990 are covered by the Bio-economics Project since May 1991. Minor expenditures under Environment have been accounted for under Fishery Resources. They will increase during 1992 to meet the costs of the dolphin study in Sri Lanka and will then be accounted for separately.

All professional posts of the Programme have been filled during the year, except for four months of the Socio-economist's post at the beginning of the year. The Information Officer's post has been filled by a Consultant on a part-time basis since May 1991 (Details are given in Table 2). No major changes are foreseen for the coming year, but it is proposed to abolish the Masterfisherman's post from May 1992.

Two new Associate Professional Officers (APO) joined the project during the year (an Economist and a Fishing Technologist). At the end of the year, there were six APOs in position. Two of them are scheduled to leave in 1992 (Socio-economist in Sri Lanka and an Aquaculturist in Bangladesh) and two others are under recruitment (a Socio-ecologist for Madras and a Socio-economist for Bangladesh). (See details in Table 2.)

There have been no significant changes in the supporting staff during the year (Table 3). However, it is anticipated that in 1992 several posts will be' abolished, particularly in the national offices in Colombo and Dhaka, to adjust to the requirements of the new third phase project.

Major expenditures under subcontract were incurred for: the construction of a hatchery in West Bengal; broadcasting services for the fisherfolk radio programme in Sri Lanka; field workers on the oyster subproject in Malaysia construction of canoes in Sri Lanka; production of video on activities in Bangladesh; and for printing reports and working papers.

Major expenditures by way of materials were purchase of oyster seed in Malaysia; stationery and other office supplies; photographs/audio visuals, video cassettes and books for the library; and materials for freshwater prawn hatchery in Bangladesh.

Major expenditures in equipment were motorcycles for the dolphin study; engines for canoes in Sri Lanka and Indonesia; a heavy duty photocopier, computer and vehicle for the Madras office; and copier for Sri Lanka.

The training activities of the projects have been reported under the respective disciplines and subprojects. The details of them are presented in Table 4. The total training time amounts to 32.6 man-years. GCP/RAS/I26/AGF has contributed US $ 0.15 million and the balance US $ 0.10 has been met by GCP/RAS/ 118/MUL.

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Table 1a

GCP/RAS/118/MUL — Budget and Expenditure (in US $)

Code	Object of Exp.	Total 1987-92	Act. Exp. 1987-90	Budget 1991	Est. Exp. 1991	Balance 1992
10	Personnel	3,736,074	2,911,438	964,000	824,636	
20	Duty Travel	874,204	696,621	240,000	177,583	
30	Contracts	718,005	614,349	120,000	103,656	
40	Gen. Op. Exp.	418,573	322,726	120,000	95,847	
50	Materials	480,851	336,902	140,000	143,949	
60	Equipment	531,694	464,425	110,000	67,269	
80	Training	503,022	449,908	177,000	53,114	
	SUB-TOTAL	7,262,423	5,796,369	1,871,000	1,466,054	
90	Servicing Cost	943,932	753,345	243,230	190,587	
	Unallocated	2,276,959				2,276,959
	GRANDTOTAL	10,483,314	6,549,714	2,114,230	1,656,641	2,276,959

Table 1b

GCP/RAS/117/MUL — Deposits and Expenditure (in US $)

Code	Object of Exp.	Deposits 1987-91	Act. Exp. 1987-90	Est. Exp. 1991	Balance 1992
10	Personnel		180,056	78,682	
20	Duty Travel		263	7,608	
40	Gen. Op. Exp.		3,519	3,326	
50	Materials		26		
	SUB-TOTAL		183,864	89,616	
90	Servicing Cost		9,193	4,481	
	GRAND TOTAL	364,171	193,057	94,097	77,017

Table 1c

GCP/RAS/126/AGF — Budget and Expenditure (in US $)

Code	Object of Exp.	Total Bgt 1990-92	Exp. 1990	Budget 1991	Estimated Exp. 1991	Balance 1992
40	Gen. Op. Exp.	10,131	1,511	1,743	8,620	
60	Supplies & Equipment	8,628	2,025	5,000	6,603	
80	Training	246,728	126,205	126,000	120,523	
	SUB-TOTAL	265,487	129,741	132,743	135,746	
90	Servicing Cost	34,513	16,866	17,257	17,647	
	Unallocated	100,000				100,000
	GRAND TOTAL	400,000	146,607	150,000	153,393	100,000

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Table 2

Professional Staff - 1991 — (GCP/RAS/118/MUL & GCP/RAS/117/MUL)

INTERNATIONAL OFFICERS

Post	Name of Incumbent (Country)	Date of (month/year) Arr.	Dep.
1. Programme Director	Engvall, L 0 (Sweden)	01/87	
2. Aquaculturist	Angell, C (USA)	01/87	
3. Development Adviser	Fernando, C (Sri Lanka)	08/90	
4. Masterfisherman	Gallene, J (France)	03/88	
5. Socio-Economist	Kristensen, H (Denmark)	05/91	
6. Information Officer**	Madhu, S R (India)	01/87	04/91
7. Fishing Technologist	Pajot, G (France)	01/87	
8. Extension Officer	Roy, R N (India)	01/88	
9. Fishery Biologist	Sivasubramaniam, K (Sri Lanka)	05/87	04/91
10. Small Craft Specialist (Ass. Prof. Officer)	Andersen, M (Denmark)	04/89	
11. Fishing Technologist (Ass. Prof. Officer)	Dahlgren, T (Sweden)	12/91	
12. Socio-Economist (Ass. Prof. Officer)	Haglund Heelas, (Ms) A M (Sweden)	10/90	
13. Economist (Ass. Prof. Officer)	Hall, R (Sweden)	06/91	
14. Socio-Economist (Ass. Prof. Officer)	Jungeling, (Ms) I (Netherlands)	07/90	
15. Sociologist (Ass. Prof. Officer)	Kristensen, (Ms) H (Denmark)	10/88	04/91
16. Aquaculturist (Ass. Prof. Officer)	Nielsen, H B (Denmark)	10/88	

NATZONAL OFFICERS

1. Programme Officer	Joseph, L (Sri Lanka)	07/87	
2. Programme Officer	Kashem, A (Bangladesh)	01/87	

** Costs covered by GCP/RAS/ 117/MUL

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Post		Name of Incumbent (Country)	w/m
INTERNATIONAL CONSULTANTS			
1.	Boat design, construction and evaluation (IND, SRL, BGD)	Gulbrandsen, O (Norway)	2.00
2.	Information**	Muthiah, S (India)	4.00
3.	Fisherfolk Radio Programme (SRL)	Pickstock, M (U.K.)	.50
4.	Outrigger canoe construction (INS)	Savins, M (Australia)	2.00
5.	Evaluation of Introduction of Beachlanding Craft (IND)	Turner, J M M (FAO)	1.00

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Table 3

Supporting Staff - 1991 — (GCP/RAS/118/MUL & GCP/RAS/117/MUL)

ADMINZSTRA TZON (Madras)

Scurville, (Ms) S	Sr. Admin. Assistant
Rajagopal, K	Admin. Assistant (Accounts)
Ashwene, H	Computer Technician
Correya, (Ms) J	Receptionist
Shanmugam, T P	Sr. Driver
Sivashanmugam, P M	Sr. Driver
Rajendran, S	Driver
Farrar, R	Messenger

INFORMATION SERVICE (Madras) **

Vijayakumar, K	Videographer
Joseph, (Ms) C	Documentalist
Amalore, E	Artist/Draughtsman
Jayaraj, S	Artist
David, (Ms) C	Secretary

SECRETARIAL SERVICE (Madras)

Abraham, (Ms) I	Typist
Ellis, (Ms) M	Secretary
Gordon, (Ms) P	Secretary
Jayakumar, (Ms) E	Secretary
Narcis, (Ms) P	Secretary
Vincent, (Ms) C	Secretary

NATIONAL OFFICE (Dhaka)

Ekram, (Ms) Z	Secretary
Syed, Nural H I	Typist
Kabir, A Q	Driver
Miah, Md. Majnu	Driver

NATIONAL OFFICE (Colombo)

Kelaart, (Ms) C	Admin. Assistant
Jayatilaka, (Ms) D L	Secretary
Premaratne, A D	Driver
Rohana Pieris, P	Driver
Ranjith, A D	Messenger

** Costs covered by GCP/RAS/117/MUL

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Table 4

Training activities 1991 (GCP/RAS/118/MUL and GCP/RAS/126/AGF)

S. No.	Title	Duration (Days)	Venue	No. of participants						
				BGD	IND	INS	MAL	MDV	SRL	THA
SEMINARS/CONSULTATIONS/WORKSHOPS										
1	Seminar on Development of Oyster Culture – for fishery officers/scientists/extension staff and private sector undertakings	3	Kuala Lumpur					42		3
2.	Fisheries Planning Consultation – for senior planning officers	15	Madras	2	3	2	2	2	2	2
3	Regional Workshop on the Use of Radio Broadcasts as a tool in Fisheries Extension and Fisherfolk Development – for senior management and extension staff	3	Colombo	2	2	2	2	2	12	2
4.	Regional Seminar on Mud Crab Culture and Trade in the Bay of Bengal Region – for scientists, fishery officers, traders etc.	4	Surat Thani	5	12	4	7		7	20
5.	Technical consultation on Small-craft and Propulsion Systems – for boat-builders, engine suppliers and government officials	3	Madras	1	21	2	1		4	1
6.	Progress reviews of *Upazilla* and NGO pilot projects – for DOF & NGO staff	9	Patuakhali	17						
7.	Marine Resource Management – for fisherfolk	2	Meemu Atoll					30		
TRAINING COURSES										
1	Regional course in Project Formulation – for fisheries officers	28	Bangkok	3	3			1	3	
2.	Savings and Credit Management – for field staff of DOF & NGOs.	4	Patuakhali	24						
3.	Poultry Rearing and Disease Prevention – for fisherfolk	3	Baufal Patuakhali	10						
4.	Carp/Prawn Polyculture Methods – for fisherfolk	3	Galachipa Patuakhali	10						
5.	Tree Planting – for fisherfolk	1	Dasminia Patuakhali	80						
6.	Health and Nutrition Education – for fishcrfolk	11	Mirzagong Patuakhali	25						
7.	Carp Nursery Practices – for fisherfolk	3	Mirzagong Patuakhali	8						
8.	Carp Nursery Practices – for fisherfolk	3	Patuakhali Sadar Patuakhali	6						
9.	Carp/Prawn Polyculture Methods – for fisherfolk	3	Patharghata Borguna	6						
10.	Health/Nutrition Education – for fisherfolk	10	Patharghata Borguna	30						
11.	Tree Planting – for fisherfolk	1	Amtali Borguna	15						
12.	Hilsa Salting – for fisherfolk	3	Patharghata Borguna	10						
13.	Poultry Rearing and Disease Control – for fisherfolk	3	Amtali Borguna	10						
14.	Health/Nutrition Education – for fisherfolk	8	Betagi Borguna	30						
15.	Health/Nutrition Education – for fisherfolk	3	Bamna Borguna	30						
16.	Carp Nursery Practices – for fisherfolk	3	Borguna Sadar Borguna	5						

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S No.	Title	Duration (Days)	Venue	No. of participants						
				BGD	IND	INS	MA L	MDV	SRI	THA
17.	Poultry Rearing and Vaccination – for fisherfolk	3	Galachipa Patuakhali	20						
18.	Freshwater Prawn Hatchery operation – for scientific officers	35	Potiya	1						
19.	Demonstration in Use of Mackerel Gillnet – for fisherfolk	2	P. Sembdan			13				
20.	Duck Raising – for extension staff and fisherfolk	7	P. Sembilan Langkat			15				
21.	Boat and Engine Maintenance – for fishermen	3	Pkl. Siata			17				
22.	Duck-rearing – for fisherfolk	2	P. Sembilan			9				
23.	Goat-rearing – for fisherfolk	2	P. Kampat			16				
24.	Cow-rearing – for fisherfolk	2	Pkl. Siata			30				
25.	Management/Leadership of Groups – for fisherfolk	2	P. Kampai			9				
26.	Banking & Administration of Funds – for fisherfolk	3	P. Kampai			19				
21.	Goat-rearing – for fisherfolk	1	P. Kampat			18				
28.	Fish Processing – for fisherwomen	6	P. Kampat P. Sembilan			51				
29.	Cow-rearing – for fisherwomen	1	Pkl. Siata			28				
30.	Boat-building – for carpenters	31	G. Sitoli			4				
31.	Boat-building – for carpenters	31	G. Sitoli			4				
32.	Construction of Outrigger Canoes – for carpenters	45	Sirumbu			2				
33.	Oyster Farming – for fishermen and extension agents	4	Pualu Sayak				15			
34.	Boat-Building – for carpenters	13	Colombo						2	
35.	Fishing Craft Operation – for fishermen	4	Colombo						4	
36.	Boat-building – for carpenters	5	Colombo						2	
31.	Scripting and Production of Radio Programmes – for Radio Programming Unit	10	Colombo							
38.	Construction of Timber Canoes – for carpenters	88	Sri Lanka						3	
39.	Credit Orientation Programme – for bank managers and senior fisheries staff	2	Hikkaduwa						30	
40.	Credit Orientation Programme – for bank managers and senior fisheries staff.	2	Negombo						30	
41.	Credit Orientation Programme – for senior bank officers	1	Colombo						51	
42.	Credit Orientation Programme – for bank and fisheries field officers	2	Hikkaduwa						33	
43.	Nutrition and Cooking – for school children and teachers	7	Kor Lao Sin Hat Hai Sai Dam Bang Ben Hin Chang							140
44.	Oyster Sauce Production – for women	4	Sam Nak Khadjadphai Huag Pling							118
45.	Handicraft Production – for women	7	Hin Chang Sin Hai							28
46.	Hairstyling – for women	4	Khadjaphai							13

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S. No.	Title	Duration (Days)	Venue	No. of participants BGD	IND	INS	MAL	MDV	SRL	THA
47.	Fisherfolk as Health Volunteers	5	Hin Chang							20
48.	Book-keeping and Accounting — for leaders/accountants of revolving funds	4	Ranong							24
49.	Handicraft and Batik Production — for FPA staff	30	Bangkok							2
50.	Progress review of Prawn Crackers and Fish Sauce Production — for subproject staff	4	Bangkok							4
51.	Fish Sauce Production — for fisherwomen	2	Samnak							6
52.	Food Processing - for fisherwomen	10	Ranong							220
53.	Batik Production — for fisherwomen	14	Hin Chang							11
54.	Fish Sauce Production — for fisherwomen	1	Kampuan							10
55.	Population/Health/Nutrition — for village health volunteers	5	Hin Chang							20
56.	Food Processing, Cooking and Nutrition — for fisherwomen, school children and teachers	8	Ranong							225
57.	Batik production — for fisherfolk	4	Samnak							5
58.	Cooking demonstration — for lactating women	1	Ranong							15
59.	Sewing training — for fisherfolk	45	Samnak							18
60.	The establishment and operation of a Community Grocery Store — for fisherfolk	4	Surat Thani							4
61.	Computer training — for DOF staff	15	Phuket							4
STUDY TOURS										
1.	Shrimp nursery and culture in West Bengal — for Bangladesh NGOs.	5	West Bengal	3						
2.	Methodology used by UBINIG to implement village projects, particularly nursery shrimp/prawn cage culture — for NGOs	14	Bangladesh	5						
3.	Research and development of brackishwater culture — for senior fishery officers	14	Thailand Philippines		3					
4.	Propulsion system - for fishermen beneficiaries and Inspectors of Fisheries	11	India		5					
5.	Observe final version of BLC — for fishermen beneficiaries and inspector of fisheries	7	India		4					
6.	UBINIG methodology in Community Development in Bangladesh — for West Bengal NGO staff	12	Chittagong Cox's Bazaar		3					
7.	Production and marketing of ducks — for fisherwomen	1	Stabat			10				
8.	Observe and discuss women's group activities — for fisherwomen	1	P. Sembilan			22				
9.	Exposure to Development of Outrigger Canoes in Nias — for fishermen	6	G. Sitoli Gomo Sirombu			12				
10.	Exposure to development of liftable propulsion systems — for fishermen	1	Doddanduwa						5	
11.	Oyster culture and spat-luring methods — for fisherfolk	2	Surat Thani							14
12.	Revolving funds, handicraft production and marketing, and batik production — for fisherwomen and project staff	5	Songkla, Yala & Narathiwat							18

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Appendix F

EVALUATION OF GCP/RAS/118/MUL

GENERAL FINDINGS AND CONCLUSIONS

1. The ultimate project **objective,** to improve the socio-economic situation of small-scale fisherfolk in coastal communities of the Bay of Bengal Region-defined as improving incomes and social conditions of the target group - is considered justified by the Mission.

2. It is observed that the Plan of Operation does not very precisely define the target group since it refers in different paragraphs to different definitions, *i.e.* "small-scale fisherfolk", "poor segments of the population in coastal fishing communities" and "women".

3. It was found that the subprojects were in most cases focused on people who can be categorized as small-scale fisherfolk. In some aquaculture and extension support subprojects, even the socio-economically most disadvantaged (poorest) group has been approached, e.g. in the shrimp-seed nursery activities in Bangladesh and India (West Bengal) and in the extension support activities in Bangladesh, India (Tamil Nadu) and Indonesia. In these subprojects, women have also been adequately addressed with technology and credit support to increase their incomes.

4. The extent to which the subprojects under extension support in the Maldives, in Sri Lanka (radio programme, credit) and in Thailand have addressed and benefitted small-scale fisherfolk is not yet known, since final reporting on the subprojects is still awaited.

5. The Sri Lanka outrigger canoe subproject is well focused on small-scale fishermen. In order to provide this group with access to the successful technology it, however, requires a well focused extension support which ensures that institutional credit is given to the intended target group instead of small entrepreneurs. Unless this support is provided, the target group is unlikely to be reached with the new and viable boats.

6. The subproject for beachlanding craft introduction was, in its planning stage, well focused on small-scale fishermen. Due to the technical requirements of the boat, which resulted in a drastic increase in its price, the technology turned out to be economically unviable without subsidized credit in most target areas. In those areas, where the BLC were viable, certain weaknesses of the mode of introduction prevented small-scale fishermen from getting access to the boats. Benefits in most cases went to the better-off fishermen.

7. Other subprojects under fishing technology, e.g. the fishing trials/demonstration for large pelagic species in off-shore waters, are, even in their planning stage, not directly focused on the target group. The fishing trials require a large-type of motorized boat which is not accessible to small-scale fisherfolk. They might, however, benefit as crew members once the viability of the off-shore fishing technology is established. Also, by diversifying the technology towards off-shore fisheries, small-scale fisherfolk would have more inshore resources left for exploitation.

8. The Mission found the target group/participatory approach fully justified, and concludes that, compared with the first phase of the project, the target group of small-scale fisherfolk has been far better focused on and been more involved in the planning of technology-oriented activities, particularly in aquaculture activities.

9. The multi-disciplinary, or integrated, approach of improving small-scale fisherfolk's living conditions is considered appropriate. It is suggested, however, that this approach in future be adopted and supported only within the given institutional set-up of a geographical area (e.g. district, province) targeted by the project. The Mission concludes that such an approach should not have been based on temporary arrangements (subproject offices) which will be dissolved after the termination of financial project inputs.

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10. The Mission observed that the objectives of the three major disciplines to introduce technologies and methodologies, have been over-ambitious in most cases. Fishing technology and aquaculture subprojects, instead of introducing ready technologies, had to restrict itself to first testing and demonstrating those.

11. An introduction of technologies which should improve incomes must have proven to be economically viable without provision of subsidies. Due to various reasons, this had been achieved only in a few cases, *i.e.*

- Beachlanding craft in selected areas of Orissa and Andhra Pradesh, India, with adequate fish resources (project phase I). In most areas, however, the craft has not proven to be viable without subsidies.
- Shark longline in Andhra Pradesh, India (project phase I).
- Outrigger canoes in Sri Lanka (project phase II).
- Floating shrimp nursery cages in Bangladesh and India, West Bengal (project phase II).
- Finfish cage culture in Thailand (project phase I).

12. The Mission concludes that, given the numerous technologies tested and the limited success achieved in demonstrating viable technologies for small-scale fisherfolk, the project has probably shown only limited positive effects on incomes of the target group.

13. In these cases where technologies, namely the beachlanding craft, the shark longlines, and the finfish cage culture, are introduced on a wider scale (either subsidized credit financed or with fisherfolk's own capital), there was no effect and impact monitoring system established by the Project which would have produced the required data to allow the Mission to evaluate the effects and impact.

14. The scope for wider introduction of technologies might not exist – even though the economic viability has been proven in certain cases – due to different social, economic and environmental situations.

15. The Mission concludes that factors which account for constraints in introducing new, economically viable technologies, include :

- No scope for improving technology (craft and gear) for inshore and lagoon capture fisheries due to overexploited resources and need for resources management.
- The utilization of offshore resources will, in many areas of the Project region, require fishing from harbours or landing centres, with minimum-size motorized boats; this technology is a tool to exploit underutilized resources rather than a means to generate employment and increase incomes of the numerous small-scale artisanal fishermen in hundreds of villages along the shorelines of the Bay of Bengal.
- Technically feasible aquaculture technologies, e.g. for shrimp, oyster and cockles are, in many cases, too profitable to allow small-scale fisherfolk access to land, water and financial inputs. Such technologies, which require little labour inputs, are generally controlled by entrepreneurs. The introduction of family-labour based aquaculture farms has generally failed for the above reasons.
- Aquaculture technologies, which are labour intensive, which require limited land, water and financial resources and which have scope for family-labour based management systems are rare in many member countries.

16. As in the case of the technical disciplines, the extension support discipline too aimed at introducing improved methodologies for extension work rather than testing and demonstrating them. The Mission concludes that the approach has been more experimental in nature in certain countries, *i.e.* Thailand, India (NGO approach), Sri Lanka and, initially, in Indonesia. In other countries, however, *i.e.* Bangladesh and Maldives, extension methods were attempted to be introduced on a wider scale by making use of the existing institutional set-ups in the Fisheries Departments.

17. The Mission suggests that activities under the extension support disciplines need to be documented, clearly presenting the objectives, implementation procedures (approach), outputs reached, reasons for certain failures, and the effects achieved or likely to be achieved. Conclusions should then be drawn from the findings of the various subprojects for further continuation or termination. Subprojects which found to have generated positive outputs and effects, although on a limited scale, should be considered for continued support by the project during the next phases. They should not be terminated with the idea that sufficient demonstration has taken place and that the Fisheries Department should be responsible for applying the successful methodology on a wider scale by themselves without support from the Project.

18. The Mission considers the extension methodology to train, advise and support fisheries field staff in performing their role as extension agents as appropriate. The tasks of the extension agents will comprise assistance to small-scale fisherfolk in improving their conditions, through better access to inputs for aquaculture and other income-and employment-generating activities in coastal areas, as well as through improved access to social facilities, e.g. health and population education. This approach implies a strong cooperation between the government or NGO institution concerned with extension and the Project.

19. The Mission observed that a weak link in the Project approach is the arrangement made to secure a continuation of subprojects or wider introduction of results when the project inputs are terminated. The Mission recommends that this aspect be reviewed during the remaining period of the Project in order to find solutions in cases where a continuation or wider application is justified.

20. The Mission observed that there have been certain side effects of the projects, e.g. the introduction of a diesel propulsion system for small craft, FRP boat-building techniques and other construction techniques of multiday fishing boats.

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Appendix G

IMPROVEMENT OF LIVING CONDITIONS OF WOMEN AND THEIR FAMILIES IN FISHING COMMUNITIES

(FPA/RAS/904/FPA)

Project Report

BACKGROUND

The FAO Population Programme with the FAO Department of Fisheries sent a mission to Asia in 1988 to give substance to the ideas that emerged during the 1984 World Conference on Fisheries Management and Development. This led to a project proposal, 'Improvement of Living Conditions of Women and their Families in Fishing Communities', as an integral part of the Bay of Bengal Programme. It set out to incorporate into fisheries projects women-oriented development activities, which, in the long run, may influence the population behaviour of the communities. The UNFPA agreed in mid-1989 to sponsor a 3½ year project. It sanctioned funds for a six-month preparatory phase.

Preparatory activities began, in most countries, in 1989. Needs appraisals and country subproject formulations, some of which began late in 1989, were undertaken in the seven BOBP member countries, and target villages were selected, keeping in mind existing BOBP subprojects.

The needs appraisals and project formulations were incorporated into a regional document by the FAO Population Programme and forwarded to UNFPA for clearance and funding. In anticipation of this, plans were made to initiate activities, starting from January 1991, in all seven countries.

PROGRESS OF WORK

At the 15th Advisory Committee Meeting of BOBP held at Colombo in January 1991, member countries proposed that, in anticipation of the funding, BOBP should initiate activities in Bangladesh, Indonesia, Maldives and Thailand, where existing extension subprojects can provide a vehicle for the activities, using funds from the SIDA-DANIDA project. Between January and June 1991 the following work was carried out :

In India, Malaysia and Sri Lanka : Detailed workplans and budgets were finalized in cooperation with counterpart agencies. Search and shortlisting of National Programme Coordinators were undertaken and institutional arrangements finalized.

In Bangladesh : The National Programme Coordinator was identified and took up her assignment. She initiated her work in ten villages of Patuakhali District. Project work was expected to begin in July 1991, focusing on promotion of income-generation through skill training, savings mobilization, establishment of village-level revolving funds and market advisory support; health, nutrition and population education and access to care; and, group mobilization of women to help them to collectively answer their problems.

In Indonesia : Three women's groups, with approximately 100 women involved, were mobilized and trained in selection, feasibility analysis and enterprise management. Through savings mobilization and credit support they have established livestock enterprises, such as rearing goats, cows and ducks. The repayments are on schedule and the women are receiving regular technical and management inputs from livestock extension staff and fisheries extension staff. Discussions and plans were in progress to provide the women with population and health education inputs.

In the Maldives : During an extended field visit to nine islands of Meemu Atoll, it was decided, in discussion with the Island Development Women's Committee, to initiate action in the three islands

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of Raimandhoo, Dhiggaru and Mulaku. The activity, implemented by the Island Women's Committees, focused on community action to eradicate rat and bat infestation, health and population education and access, and leadership training for the Women's Committees to enable them to better address their problems.

In Thailand : Women's activities were initiated in four villages in Ranong District. Two project staff associated with the women's activities were trained in identifying rural enterprises of potential to women, in food processing, batik making, and in using reeds for handicrafts. Women in the participating villages received training in food processing and batik making. One group has established a batik unit which is in production and has had reasonable success in marketing its products. Some women also received training in macrame, hair styling and in book-keeping and are now in the process of establishing their trades. As a part of the information campaign in health/nutrition/population, 12 women volunteers were trained as village-level health volunteers in cooperation with the Health Department.

TERMINATION OF THE PROJECT

In July 1991, BOBP was informed that, while approving the project in principle, UNFPA was unable to make funds available, as funds for regional activities in the Asian and Pacific region have already been over-allocated.

Consequent to this decision, BOBP terminated activities in India, Sri Lanka and Malaysia, where BOBP does not have extension subprojects to facilitate women's activities as planned. In the Maldives, Bangladesh, Thailand and Indonesia, in line with the recommendations of the Advisory Committee, some of the women's activities, planned for in the UNFPA project, were incorporated into existing extension subprojects, with modified workplans, to fit the lowered fund availability from SIDA-DANIDA project funds. These are reported in the respective subproject reports.

Several of the BOBP member countries have expressed their concern at the termination and, in some cases, reduced levels of implementation, as they felt that this was an important activity. More than the concern of the member countries, one needs to think about the women in the fishing communities of the seven countries whose aspirations had been raised and who had participated enthusiastically in the preparation, all of which came to nought. Even should UNFPA decide to fund the project in 1992, there is the concern that the decreased time overlap of the project with the SIDA-DANIDA second phase would give BOBP very little time to build in sustainable management into the women's project.

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Appendix H
POST-HARVEST FISHERIES PROJECT
(ODA)
Annual Report 1991

INTRODUCTION

The Post-Harvest Project, although separately funded by the Overseas Development Administration of the United Kingdom and managed through the Natural Resources Institute, is a fully integrated technical unit of the BOBP. The Project commenced in August 1987 and since September 1989 is in its second phase. At present three BOB member countries are involved in this Project: India, Bangladesh and Sri Lanka. The principal objectives of the Project are: **to reduce post-harvest losses and improve the utilization of fish in order to enhance incomes of those involved in fish handling and marketing, and to improve the distribution of fish to the consumer.**

SUMMARY OF MAIN ACTIVITIES

1991 has seen the conclusion of two further major subprojects in India (by- catch utilization and prawn feeds development) as well as the implementation of several new activities in Sri Lanka. The inputs for Bangladesh were reprogrammed as a result of the cyclone in March.

Greatest effort has continued to be made in India where six subprojects comprising 12 specific activities have been, or are being, implemented :

Improved utilization of low-value fish has concentrated on upgrading traditional anchovy drying and marketing carried out in southern India in order to increase the value of the product and help optimize earnings which are currently negatively affected by poor processing practices at the artisanal level. Earlier, it had been felt that re-establishing the export market for this commodity to Sri Lanka, to compete with the high quality Thai product introduced in the mid-80s, would be an important criteria for success. However, market research carried out in India during 1991 has revealed that demand from the domestic market for the improved product is considerable.

Pilot production set up with the participation of two fishing communities and coordinated by the Kanniyakumari District Fishermen's Federation (KDFSF), an active non-governmental South Indian fishermen's organization, has demonstrated the technical and social feasibility of implementation. Marketing trials carried out during the last quarter have been positive, with wholesale (Madras) prices for the improved product being double those of the traditional product.

Further collaborative work has been carried out in coordination with The Central Institute of Fisheries Technology (CIFT), Kochi, not only with regard to technical advice on the anchovy drying activity mentioned above, but also on the spoilage characteristics of flyingfish, identified as a potential offshore resource by BOBP.

Use **of ice at sea** on artisanal fishing craft has concentrated both on extension training in the use of ice and GRP insulated boxes, and on implementation of the official subsidy and credit scheme sanctioned earlier in the year by the Government of Andhra Pradesh. Limited progress in the latter, in combination with the high cost of the box (and, hence, uncertain financial benefits), are issues which have led to a slower-than-hoped uptake of this technology by the poorer fishermen. An encouraging sign, however, is that a number of private fish traders have recently become involved in this activity and are independently supplying the GRP boxes to nava fishing vessels.

Awareness of the potential benefits of using ice per se has increased considerably in the target communities. This has encouraged some fishermen to take ice to sea in alternative, lower cost containers, such as baskets. Further effort has therefore been directed towards simple and low cost icing systems which are more financially attractive to less well-off fishermen.

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Shrimp trawler by-catch has continued to be a subject of intensive **study** during this period. The pilot commercial project set up in 1990 and designed to establish the socio-economic and technical feasibility of increasing by-catch landings in Vishakhapatnam, continued **through till** April. The overall conclusions of the study were that a combination of high landed price and low market value was responsible for the lack of any development opportunity in this area. The only potential means of landing greater quantities, that of collection at sea, is technically difficult, capital intensive and dismissed by trawler operators are unworkable. Pending the publication of a dissemination report, work on this subproject has been terminated.

Fish marketing activities have received much attention and have centred on providing direct support to the small-scale marketing sector. The promotion of newly designed aluminium fish containers for itinerant women vendors has resulted in a large demand for these in Tamil Nadu. So far, 1072 orders from 17 women's groups have been received. Distribution has been organized both through NGOs and official women's cooperatives. A small-scale credit element is provided through these organizations and over Rs.100,000 Grant in Aid has been sanctioned by the Women's Social Welfare Board of Tamil Nadu in support of this activity. Extensive support in marketing has been provided to the KDFSF, through both the funding of a full-time Marketing Adviser post created within this organization and the provision of advice on variable marketing strategies. One of these, the deployment of a large permanent ice-cum-fish box constructed by a fishermen's society in Kanniyakumari, has been instrumental in increasing and stabilizing prices paid to its users.

In cooperation with the Marketing Research Group of India (MARG), market research into consumer attitudes to fish consumption in Madras has been carried out. This has revealed some interesting trends (such as a steady increase in the non-vegetarian, fish-eating proportion of the population) and provides a deep insight into fish marketing practices and how these are perceived by the consumer. Studies such as this, and others yet to be carried out, could play key roles in future national market development activities.

Shark leather production technology has gathered momentum during the year, after a difficult start due to apparent lack of interest from the international market. Apparently, as a result of a promotion article published in INFOFISH International, renewed interest by overseas buyers has led to the signing of contract with the Central Leather Research Institute in Madras to define production parameters and carry out technology transfer to the industry. In addition, agreements have been made with two shark producers who wish to cooperate with the Project in developing this market. Owing to the increased scale of inputs for this activity, it has been shown in this report as a separate subproject.

Development of water stable feeds for *P.* monodon continued until March with the final farm scale feeding trial in Andhra Pradesh, which tested the pelletized feed developed by the Project alongside simple local diets. This subproject has now been concluded, a video film has been produced and a comprehensive handbook for feeds development in India is currently in press.

Activities by the project in Sri Lanka were formally initiated in February this year, somewhat later than had **been** originally envisaged.

Reduction of post-harvest losses, by improving onboard and onshore handling procedures and fish processing, has resulted in two studies. First, an evaluation of small-scale fish marketing systems with special reference to the stages at which losses occur. This identified certain constraints in marketing, resulting from inefficient supply of ice to the landing centres, as well as several technical and socio-economic problems experienced by small-scale traders. As a result, a long-term baseline study of itinerant cycle traders in Colombo is currently underway, and a technical evaluation of new ice storage systems is being carried out. Second, a technical evaluation of the effect on fish quality of improved handling methods on offshore fishing vessels. This highlighted several technical and social problems related to the proposal for introducing gutting at sea as a means of extending the storage life of fish at sea by the multi-day offshore fleet.

Phase two inputs for Bangladesh by the Project were modified due to the disastrous cyclone of March. Activities in Bangladesh are, for the sake of convenience, being carried out under the auspices of the BOBP Extension and Set Bagnet projects (EXT/FED/BGD and RES/SBN/BGD).

Fisheries extension development included inputs to small-scale fishing communities in the Chittagong region which were severely affected by the cyclone. These included support to CODEC, a locally active fisheries NGO, in assessing the feasibility of improving landed fish quality through the effective use of ice. Training in simple post-harvest fish handling was provided to CODEC's extension workers. A visit to South India by three CODEC staff to discuss organizational aspects of NGOs in the fisheries sector was arranged. The planned activity on screening dried fish for DDT and other insecticides was postponed due to severe flood damage of Chittagong's fish stocks. This is due to be reinitiated during the first quarter of 1992.

Set bagnet marketing was the subject of a study which recommended that, owing to the importance of this fishery with regard to its supply of large quantities of low cost fish for popular consumption in Bangladesh, high priority should be awarded to gathering further in-depth socio-economic baseline data on marketing the SBN catch.

The current phase of the ODA project is due to terminate on March 31, 1992 after a three month extension. The total running time of Phase Two will then have been 2 years 6 months. Owing to the continuing strong support for the Project from the three member countries concerned, India, Sri Lanka and Bangladesh, the Overseas Development Administration is currently considering a further five year input (Phase Three) to the BOBP in the field of post-harvest fisheries. In order to help identify suitable Phase Three areas of activity, an evaluation of the impact of the project's various Phase Two activities was conducted during October by integrated Marine Management Co. Ltd. (UK). "Targets for 1992", specified below, assume continuation of activities from April 1, 1992.

Approximate expenditure :	Apr-Sept (1991)	Total Phase II (Sept '89-Sept '91)	Allocation
	£124,028	£542,088	£659,032

Further details of the subprojects and related activities follow :

INDIA

Subproject : Improved Utilization of Low-value Fish (ODA/P1/IND)

OBJECTIVES	To assess the market potential for expanding the utilization of certain low- value/low-demand species, such as shark and flyingfish, by identifying novel marketing strategies which enhance their value both as fresh fish and processed value-added products.
STATUS 1990	Studies completed on traditional anchovy drying, and new drying racks designed and tested. Shark marketing study completed, and shark leather trials ongoing. Marketing study of flyingfish completed.

Targets 1991	*Achievements*
	Dried Anchovy (ODA/PIB/IND)
Establish pilot commercial production of high quality dried anchovy in collaboration with KDFSF and test market produce in Sri Lanka and home market	Pilot production set up with participation of two member ***sangams*** of the KDFSF in two villages. 800 kg of high quality product manufactured and sold in Madras at twice current wholesale rates. KDFSF mission visited Sri Lanka to assess market potential.

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Disseminate anchovy drying technology through training course and production of extension guides	Extension guides produced in two languages and hands-on training provided to fishermen through active participation in pilot production.

Flyingfish (ODA/P1A/IND)

Unscheduled	Work completed on spoilage characteristics and flyingfish and utilization of flyingfish eggs, in response to outside enquiry and in support of CIFT activities. Report produced indicates heavy losses of flyingfish due to poor handling.

Assessment

Another poor anchovy season hampered the development of the pilot production trials and limited the amount of marketing data available. Several fishermen have taken up the drying rack technology on an individual basis. KDFSF is enthusiastic about this activity and intends to promote and expand it over the next season.

Post-harvest losses in flyingfish are very high due to the great difficulties involved in handling fish on the traditional *kattumaram* craft. Product on sale in local markets is of extremely poor quality. Scope for using ice on the *kattumaram* to be investigated under ODA/P3A/IND.

Targets 1992

- Continue with support to KDFSF in the expansion and promotion of improved anchovy drying and marketing.
- Initiate production trials with anchovy traders in southeast Tamil Nadu.
- Market development of high quality dried anchovy in India and Sri Lanka. This would include the identification of new marketing channels, improved product packaging and promotion.

Future

Establishment of improved anchovy drying methodology and supporting marketing infrastructure in the region. Re-establishment of Indian exports to Sri Lanka.

Su bproject : Use of Ice *(ODA/P3A/IND)*

OBJECTIVES	To improve the quality and value of fish landed by artisanal fishing boats through the promotion of use of ice onboard and use of GRP insulated fish boxes.
STATUS 1990	Agreement reached with State Departments of Fisheries (Andhra Pradesh and Tamil Nadu) on provision of 25-33 per cent subsidy to popularize ice boxes. Commercial producer identified, promotion and training activities implemented and extension guides produced in local languages.

Targets 1991	*Achievements*
Introduction of at least 100 GRP boxes with state subsidy in Tamil Nadu/Andhra Pradesh	A total of 124 boxes were introduced to artisanal fishermen of Andhra Pradesh and Tamil Nadu with subsidy from project. Sanction accorded by Andhra Pradesh State Government to provide 25 per cent subsidy and credit facilities for the financing of 100 boxes during FYs '90-'91 and '91-'92. Delays in implementation of these facilities until final quarter 1991 have meant that few subsidized boxes have been received by fishermen.

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	The GRP insulated box has, however, been taken up by the private sector and at least 100 units are being provided on credit terms to *nava* fishermen by traders.
Provide support to State Government Directorates of Fisheries for promotion of ice boxes, identification of beneficiaries, and their training.	57 training and promotion visits have been made to fishing villages in Tamil Nadu and Andhra Pradesh in collaboration with the respective DOF. Help has been provided in identification of beneficiaries able to take advantage of the State Government subsidy scheme and to stimulate their awareness of the benefits of using ice.
Production of economic profiles of ice boxes for small-scale credit facilities from banks	Credit already being made available through banks as part of State Government subsidy scheme. Sanction given by Andhra Pradesh Government to provide ice boxes as standard equipment in up to 600 new nava to be constructed through National Cooperative Development Corporation funding in Andhra Pradesh.
Cost reduction of insulated box	Several options identified which are less costly than the GRP box. These include wooden and HDPE varieties. Some of these are undergoing tests on fishing boats.
Carry out trials with a 2 t capacity permanent ice box (PIB) in Kanniyakumari. Construct more PIBs in communities selected by KDFSF	The PIB originally constructed in late 1990 could not be tested until the start of the 1991 season (September). The PIB has been used continuously since then, has stimulated an increase in fish prices paid to the *sangam* and has resulted in the signing of a supply contract with a local trader. More PIBs have not yet been constructed as results from the first lot are awaited.

Assessment

The relatively high cost of the GRP box has led to an initial slowness in its being taken up by small-scale fishermen. The box has proved more popular with mechanized boats, which tend to use them primarily for shrimp storage. The original target group, *nava* fishermen catching seer fish around Kakinada, is now less distinct as the seer fishery has undergone an apparent collapse during the last year. Taking up the use of ice by artisanal fishermen, in general, has been encouraged through the Project's intensive promotional extension activities. There is a need to develop appropriate lower-cost methods of taking ice to sea.

The fact that the GRP insulated box has also been taken up by the private sector (at least 100 units so far being provided on credit terms to *nuvu* fishermen by traders) would appear to indicate a degree of acceptance by the small-scale sector. Clearly inter- and intra-regional differences will affect the economies of the box and these must be taken into account when carrying out promotion.

P I B success relates to its now-proven ability to maintain landed prices of high value species, such as seer, given that the target group is sufficiently organized to administer this.

Targets 1992

- Development and promotion of appropriate, low-cost technologies to enable fishermen both to take ice to sea and to use ice on shore to preserve fish quality.
- Continuation of cost-reduction exercise for alternative insulated ice-boxes and ice-cum-fish storage systems, such as the PlB, to be used in fishing communities.
- Provision of support to State Government DOFs in promoting the **use of ice in general.**

Future

Provision of technical support and promotion by Project until the use of ice becomes fully accepted by target communities.

Subproject : Shrimp Trawler By-ca tcb (ODA /P5A /IND)

OBJECTIVES	To establish the socio-economic and technical feasibility of increasing landings of fish by-catch from prawn trawlers.
STATUS 1990	Pilot processing and marketing trials set up using trawler by-catch. Data gathering ongoing.

Targets I991	*Achievements*
Continue pilot operation in order to gather more socio-economic and technical data	Trials continued until April 1991. These were carried out in and around Vishakhapatnam to procure, process and market frozen by-catch from large (>20m) trawlers. Participation of two women's groups in fish drying activity. Trawler survey also continued to gather data on available cold storage capacities and variety and sizes of species landed.
Based on outcome of the above, either terminate or promote the work	Evaluation of activites demonstrated its non-viability due to several factors, but mainly a combination of high landed price and low market value. Awareness at all levels of by-catch problems greatly increased due to project effort.
Study of artisanal by-catch landing systems said to be operating in West Bengal	Study visit carried out in West Bengal, but no sign of by-catch collection evident. Appears to be an infrequent and opportunistic business only.

Assessment

Most by-catch from small and medium-sized short-trip trawlers is already being landed and used for fish meal, dry fish or fresh fish marketing. The bulk of the discards are by large, long-trip trawlers. Marketing trials carried out in major cities on the species normally discarded by these vessels, indicate negative economic returns. Despite good fish size (range 10-30 cm) and good quality, low market value is a limiting factor. High capital cost of large trawlers implies that fish raw-material price must be high enough to provide incentive to land.

Targets 1992

- Reporting.

Future

No further work on this activity envisaged.

Subproject : Fish Marketing (ODA/P6/IND)

OBJECTIVES	To improve post-harvest fish handling and marketing, and enhance the present levels of income of the small-scale sector in general, through the provision of advice on infrastructnral improvements and marketing strategies.

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STATUS 1990	Baseline market study in Tamil Nadu and Orissa completed. Reports published. Marketing support provided to KDFSF, and PIB constructed. Women's fish container programme ongoing.
Targets 1991	*Achievements*
	Market research (ODA/P6E/IND)
Undertake consumer-based study in Madras in order to identify constraints in fish marketing. Make recommendation to local municipal authority and DOF to implement any recommendations on improvements highlighted by the study.	Consumer market research carried out by Marketing Research Group (MARC) in Madras. Two reports issued, covering results of quantitative and qualitative analysis. Copies forwarded to DOF for comments.
	Improved women's fish marketing containers (ODA/P6A/IND)
Promote new fish containers in Kanniyakumari District and other areas of Tamil Nadu with financial support from State DOF. Target: Sale of 1000 containers to marketing women.	Final design of fish container agreed on with women beneficiaries and factory production initiated in Madras. 1072 orders from 17 women's groups now obtained. Grant-in-Aid subsidy sanctioned by State Social Welfare Board of Tamil Nadu. Credit schemes agreed by NGOs. Extension guide published in three languages.
Construction of more PIB in collaboration with both KDFSF and State Fisheries Department	(see under ODA/P3A/IND: Use of ice)
	Marketing support to KDFSF (ODA/P6B/IND)
Provision of marketing support to KDFSF	Marketing Adviser post created within KDFSF and funded by Project. Advice provided on TORs and strategies. Marketing and technical workshops held with three member ***sangams.*** Three-day workshop held on Project Financing and Proposal Preparation for 12 members of four NGOs.

Assessment

The in-depth market research carried out by MARG has enabled the clear definition of several constraints to fish consumption. Amongst these are poor sanitation and hygiene, and general misconceptions about food value of different fish species. Such work will be of value in drawing up new marketing strategies and identifying new species for target promotion.

The strong and positive response to the fish container by the women vendors demonstrates the need for both technical and financial support to this much ignored sector. Certain transport difficulties have yet to be resolved.

Support to the KDFSF has been extremely positive. The strong institutional base of the NGO has provided the Project with an excellent counterpart and has greatly facilitated testing the socio-economic and technical feasibility of several simple technologies, such as the PIB and the anchovy drying systems.

Targets I992

- Carry out further market research into dry fish consumption patterns.
- Establish manufacture and supply links directly with NGOs or Government Departments, such as S S W B, for fish marketing containers.
- Develop support to KDFSF through provision of advice on marketing strategies. Pilot scale internal marketing of high value fresh fish to be evaluated.
- Regional seminar (IND/BGD/SRL) on internal fish marketing.
- Carry out feasibility study for formation of a non-governmental Marine Products Internal Marketing Agency responsible for improving and further developing the domestic fish marketing sector.

Future

The formation of Internal Marketing Agency is seen as an essential step towards guiding market development in India. Such an organization would be responsible for developing new strategies, promotional activities and could channel donor funding towards critical areas of need.

Market infrastructure will take many years to develop. Continuous support to local institutions, backed by sound socio-economic and technical research, is absolutely essential for this work. Small infrastructural inputs, such as PIBs will greatly help at the community level to bring about improvements both in general fish quality and producer incomes.

***Subproject : Shark** (ODA /P7A /IND)*

OBJECTIVES	To promote the use of shark and shark products. Specifically, to develop the technology for shark skin leather production.
STATUS 1990	Study on market for shark completed and published. Shark leather production trials ongoing and indicating positive achievements.

Targets 1991	*Achievements*
Shark leather trial production and marketing to continue in order to demonstrate technical and economic feasibility	Further technical work carried out by CLRI under contract to BOBP-ODA resulted in considerable progress in quality improvement. Interest from external markets has quickened and two good skin suppliers have been identified.

Assessment

A good international market exists for high quality shark leather. India's low production costs for leather goods would make it a competitive supplier. The prime constraints — irregularity of supply of good quality skins and inadequate finishing standards — have now been largely overcome. Considerable capital investment is required for any success in this field and, although it may lead to some value-addition of fresh whole shark, the net effect that any success in this field will have on the small-scale fishermen is uncertain. He will certainly not be a direct beneficiary of this technology.

Target 1992

- Finalize production technology and specifications enabling private sector tanneries to take over processing and marketing.
- Provide support to private sector in establishing overseas market contacts.
- Conclude subproject by March 31, 1992.

Future

With careful planning and selection of counterpart companies, technology transfer to the private sector is feasible, given full resolution of the constraints highlighted above. The future of the industry will then largely depend on the maintenance of high quality standards.

Subproject : Development of Prawn Feeds (ODA /P8A /IND)

OBJECTIVES	To involve lower income groups in the expanding prawn culture sector through improving existing and developing new low-cost feeds, which utilize indigenous raw materials, including low-value fish.
STATUS 1990	Commercial feed production initiated at Mysore Snack Foods Ltd. Feeding trials completed in West Bengal with CIBA indicate technical feasibility of manufacturing high quality diets in India. Farm scale trials in Andhra Pradesh ongoing.

Targets 1991	*Achievements*
Harvest of Kakinada-based farm trials	Farm trials completed and report issued. Indications are that locally prepared diets are more cost effective than had been thought.
Production of final report on feed formulation and economics, with recommendations on future activities	Dissemination document currently in press. Video film produced showing small-scale farming in Andhra Pradesh and how this may be developed.
Termination of subproject under Post-Harvest Project	Done. Support to CIBA continued through supply of chemicals and some equipment.

Assessment

This subproject has provided useful guidelines to the whole brackishwater prawn aquaculture sector. Some of these guidelines have been adopted by the flourishing private sector feed mills. Further work is needed in the development of lower cost feeds for the small-scale sector based on on-the-spot preparation by artisanal producers using locally available ingredients.

Subproject : Fisheries Extension Development EXT/FED/BGD
(ODA/P1/BGD,ODA/P3/BGD)

OBJECTIVES (ODA components)	To provide direct advice to extension services and NGOs on potential improvements in post-harvest fisheries. Aimed principally at reduction of losses and income enhancement.
STATUS 1990	Study mission identifies insect infestation control in dried fish to be a key area of activity.

Targets 1991	*Achievements*
	*Insect control in dried **fish** (ODA/P3/BGD)*
Initiate dry fish sampling and analysis programme in order to quantify prevailing levels of pesticide residues and determine whether these represent a threat to public health. Depending on results of above, to make recommendations on improvements in insecticide use and application.	Sampling programme postponed due to heavy dried fish losses in Chittagong during cyclone. *Ad hoc* sampling by mission revealed high DDT levels
	Support to NGOs (ODA/P1/BGD)
Unscheduled	Support was provided to CODEC (Chittagong) in cyclone relief activities: construction of a permanent ice box for fish storage in Kumira village, typical of the communities relying heavily on set bagnet and seasonal *hilsa* catches. An assessment of the extent of existing losses was carried out and training in fish handling was provided to CODEC extension officers.

Assessment

It is clear that ice can be useful in maintaining fish prices and, hence, increasing the incomes of fishermen and small-scale traders. However, in any such delicately balanced community, there is a risk that enhancing incomes of one group will deplete the incomes of another. The socio-economics of this system must be clearly understood prior to larger scale intervention.

Losses appear to result primarily from the often limited access to clearing the nets due to tides, weather, moon phase etc. Hence, fish is often landed in already poor condition. Whether this can realistically be resolved is at present unknown.

Targets 1992

— Insecticide screening programme with support from the University of Chittagong and Department of Fisheries.

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— Carry out a study of the use and efficacy of alternative, safe insecticides.

— Continue to provide support for CODEC in the use of ice, fish drying methods etc. and provide training in project identification, assessment design and planning for NGO staff.

Subproject : Bioeconomics of Set Bagnet Fisheries (RES/BGD)

OBJECTIVES (ODA components)	Socio-economic evaluation of the marketing of set bagnet catch by the respective communities involved.
STATUS 1990	No activity

Targets 1991	*Achievements*
Carry out socio-economic study of the marketing of set bagnet catch and determine its importance to the SBN communities relative to other sources of income.	Initial study completed and recommendations made. The study highlights the great importance that the set bagnet catch has on the small-scale sector, from fisherman to consumer.

Assessment

The product of the SBN fishery is of vital economic importance not only to the fishing community but also to the vast and diverse marketing infrastructure which conveys SBN caught fish to all parts of Bangladesh. Any management measures arrived at controlling this fishery would have marked ramifications on the most deprived sector of fish producing and marketing sector.

Targets 1992

— Carry out in-depth and longer-term socio-economic study of the marketing activities related to the SBN fishery.

SRI LANKA

Subproject : Reduction of Post-Harvest Losses (ODA/SRL)

OBJECTIVES	Reduction of losses through improved onboard and onshore handling procedures.
STATUS 1990	Nil. Approval for project awaited.

Targets 1991	*Achievements*
Evaluation of post-harvest handling systems to identify where losses occur	Study completed with NARA indicated constraints in ice supply to certain landing centres. A further study identified social problems in the implementation of a proposal to instal trial ice storage boxes in a fishing village and proposal, therefore, abandoned.

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	Socio-economic study of cycle traders in St. John's Market, Colombo, currently underway. This aims to identify needs of this disenfranchised group and make recommendations on technical and socio-economic assistance.
Technical evaluation of effect on fish quality of improved handling on offshore fishing vessels	Gutting of skipjack tuna at sea shown to be a non-viable option due to several technical and social problems, including: fish spoilage caused by delays prior to gutting; market rejection of non-intact fish; the additional cost of manpower for gutting not being recoverable; and fish guts being sold as food.

Assessment

The heavy demand for fish in Sri Lanka tends to result in quality taking second place to quantity. Although poor supply of ice can often create localized problems, the means of providing useful and viable technical interventions aimed at improving quality are not at all clear. What is clear is that the role of the small-scale trader is vital to inland marketing. This group is extremely backward in terms of technical innovation and social organization and will certainly benefit from appropriate technical advice.

Targets 1992

- Continue with socio-economic study of cycle traders and evaluation of new technologies to assist their operation.

Staff — Post-Harvest Fisheries Project (1990)

Post	Name of incumbent	Date of arrival (Month/Year)
INTERNATIONAL STAFF		
Post-Harvest Fisheries Adviser	Bostock, T W (U.K.)	4/90

Project	Consultant	Period
NATIONAL CONSULTANTS *(India)*		man-month
1. Prawn feeds and by-catch coordination	Rajendran, A.D.I.	12.00
2. Social development/trainer — Ice boxes	Vimala, (Ms) S	12.00
3. Marketing — By-catch	Rao, C.V.	8.00
4. Social development/field liaison by-catch and fish containers	Kamila, (Ms) A	12.00
5. Marketing/KDFSF marketing adviser	Vijaynidhi, R	12.00
6. Social anthropologist — KDFSF, liaison and anchovy drying	Kalavathy M.H.	8.00
7. CIFT — Fish drying/ice boxes	Kandoran, M.K.	2.25
8. By-catch — Field data collector	Reddy, A.M.	3.00
9. Ice boxes — Field promoter	Salagrama, V	4.00
10. CIFT — Flyingfish	J Joseph	1.25

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Project		Consultant	Period
11.	By-catch – Administrator	Seetha Ramaswami	5.00
12.	By-catch – Women's awareness training	Soosaiya	0.25
13.	Project planning course, Madras	Velumuthu and Harigopal	0.10
14.	Prawn marketing study and workshops	SIFFS: Vivekanandan	0.25
15.	Market research in fresh fish	Marketing Research Group (MARG) – two persons	6.00
16.	Shark leather technology	Central Leather Research Institute (CLRI)	4.00
17.	Artist	Ravikumar	5.00
	TOTAL LOCAL CONSULTANTS		95.10

U K CONSULTANTS

1.	Prawn feed (India)	Wood, J	0.05
2.	Prawn feed (India)	Brown, (Ms) J	0.50
3.	Post-harvest losses (SRL)	Rodgers, J	0.75
4.	By-catch (India)	Gordon, (Ms) A	0.50
5.	By-catch (India)	Blake, B	0.50
6.	Post-harvest losses: Technical (SRL)	Clucas, I	1.00
7.	Post-harvest losses: Marketing (SRL)	Bennett, B	1.00
8.	Marketing strategies KDSFSF (IND)	Stickings, J	0.50
9.	Set bagnet marketing (BGD)	Bennett, B	0.75
10.	CODEC support/cyclone (BGD)	Johnson, (Ms) S	1.50
11.	Shark leather (IND)	Graves R	0.50
	TOTAL		7.85

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Appendix I

BIO-ECONOMICS OF SMALL-SCALE FISHERIES (RAS/91/006)

Annual Report — 1991

INTRODUCTION

This regional project was proposed in 1987 and endorsed by all member countries of the BOBP, except India which at the end of 1989, decided not to participate in the project. Consequently, the 14th AC meeting in January 1990 recommended that UNDP approval of the project be expedited, that a regional meeting be held to identify high priority areas for activities in the field of bio-economics and that a work programme be prepared.

In the meantime, some bio-economics oriented activities – Study of ***Kuttumaram*** Fisheries in India (Kothapatnam, Andhra Pradesh, (1988-89) and of Set Bagnet Fisheries in Bangladesh (1988-91) – were funded by the Small-Scale Fisherfolk Communities project GCP/RAS/ 118/MUL. Regional Meetings/Workshops on bio-economics (Penang; May and October 1990) and on Artificial Reefs, (Phuket, Thailand; November, 1990) were also held, sponsored by GCP/RAS/ 118/MUL and GCP/RAS/126/AGF.

In May 1991, UNDP approved the project with a budget of US $ 1 million over 31/2 years – EOD 01/06/91 and NTE 30/08/94. Bangladesh, Indonesia, Malaysia, Maldives, Sri Lanka and Thailand are the participating countries.

The main objectives are (1) to introduce new methodologies for'assessment of bio-economics and socio-economics of selected fisheries and (2) improve the understanding of the concerned fisherfolk, in order to enable them to participate in the rational utilization of the resources and in the establishment and implementation of fishery management measures.

Considering that some of the preparatory activities of the project had already been undertaken by GCP/RAS/ 118/MUL, the duration of the Project could be reduced. On the other hand, costs have increased considerably since the time of submission of the proposal and more staff inputs than originally anticipated, particularly in the field of socio-economics, would be required. It was therefore proposed to reduce the duration of the Project to 2 years 9 months without changing the budget. And to this UNDP has agreed.

The summary reports of the subprojects in each of the participating countries, are presented below.

Subproject : General Services (RES/GEN)

Targets 1991	*Achievements*
Regional training in bio-economics	Postponed till 1992 in view of the delayed start of the sampling programmes of the subproject.
Comic book on Resources and Management as Extension material for fisherfolk	The first issue on craft and gear behaviour was field tested by a Tamil Nadu Government agency and 30,000 copies (in Tamil and Telugu) printed for distribution to fisherfolk through various organizations engaged in the education of fisherfolk (See Bay *of* ***Bengal News,*** No. 41). For the second issue, on biological characteristics of fisheries, the baseline material had been prepared and submitted for preparation of illustrations.
Unscheduled	A review on Cephalopod fisheries and resources in the Bay of Bengal (See ***Bay*** of ***Bengal*** News No. 44) was prepared. It was intended for the planned consultation on squid fishing, which was cancelled (Ref FIT/GEN of GCP/RAS/ 118/MUL.

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Subproject : Bio-economic and Socio-economic Impact of Fish Aggregating Devices in the Maldives (RES/FAD/MDV)

OBJECTIVES	To assess the impact the use of FADS has on productivity in small-scale fishing for tuna and on the living conditions of fisherfolk. To study the economics of such use.
STATUS 1990	A regional workshop, to understand the bio-economic concept, was held and a working document for the study was prepared.

Targets 1991	*Achievements*
Assigning of project personnel	One Fishing Technologist, one Socio- economist and eight selected fishermen, one on each of the eight islands to collect catch particulars, have. been assigned.
Review of past experiences in the Maldives and identification of suitable types of FADS.	FADs of various designs have been deployed in the Maldives in the past. Though a certain design has been identified as suitable, a comprehensive review of performance was not achieved. Three units of discus shaped FADs of FRP filled with polyurethane foam, with an inverse catenary type mooring system of nylon/propylene composite rope and 3t concrete anchor, were chosen from past experience.
Deployment sites and islands to be surveyed for socio-economic aspects	Sites close to S.Male, Meemu and Vaavu atolls — fished from eight islands — were selected. Frame survey for socio-economic assessment was undertaken in all eight islands. The existence of significant numbers of non-fishing households and a few households with no income from any source has been recorded.
Procurement of material and equipment	Orders for chemicals and materials for the FRP FAD with foam and mooring ropes were placed.
Training of project staff and education of selected fishermen	The eight fishermen were trained in the field to collect catch, economic and size composition data.
Pre-deployment surveys and assessments	Past six years' catch data for the relevant islands were compiled and catch rates and species composition analyzed. Behavioral study of tuna in the areas of FAD deployment could not be undertaken in 1991 due to lack of personnel.
Fabrication and deployment of FADs	Not done. Deployment will depend partly on arrival date of material, but mainly on completion of predeployment surveys of tuna behaviour, at selected sites.

Assessment

There has been slow progress due to lack of staff and the involvement of the two counterpart staff in other activities. Unless time input by counterpart staff is significantly increased, there may be difficulties in implementing the subproject as scheduled. Limitations in the effectiveness of

sampling of catches and size composition, conducted by fishermen, also warrant more time input from technical staff of the Ministry of Fisheries and Agriculture.

Targets I992

- Socio-economic surveys on islands selected from the frame survey
- Predeployment survey and assessments at the sites for deployment
- Fabrication of FADs and deployment
- Post-deployment survey (one year) extending into 1993
- Discussions with fisherfolk on performance and management issues concerning FADs

Future

- Completion' of socio-economic surveys
- Completion of post-deployment survey
- Analysis and reporting
- Discussions with fisherfolk on the results obtained and their consequences to tuna fisheries and fisherfolk

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Subproject : Set Bagnet Fisheries, Bangladesh (RES/SBN/BGD)

OBJECTIVES	Better understanding of the functional mechanism of the gear with reference to the biological and socio-economic aspects of the fishery, ***vis-a-vis*** other interactive fisheries. The set bagnet fisheries account for about 30 per cent of the marine/brackishwater catch.
STATUS 1990	A one-year systematic sampling of bio-economics of set bagnet fisheries in six different locations was more or less completed by the end of 1990. Corresponding socio-economic surveys were lagging behind and were still in progress. (The subproject was earlier implemented under GCP/RAS/l18/MUL.)

Targets 1991	*Achievements*
Assessment of mortality rates of shrimp seed during transport and culture.	Done. The mortality rate tends to be very high, but varies with transported distance and age of the post-larvae.
Completion of socio-economic survey of changes	Done, but interrupted by the cyclone. Set bagnet activities and income thereof vary seasonally, but there is little other income from other sources to compensate for the fluctuations.
Census of trammelnets in SBN survey areas 1+2	Conducted as planned. The nets were found to be concentrated mainly in Area l and there had been no significant expansion into Area 2. The number of nets had not increased significantly in recent years.
Marketing study of SBN catches	Conducted, but estimations are partially affected by the influence of the cyclonic damage to fishing activities. Rough estimation of the

	production of about four species during this seasonal fishery was made and their size ranges identified by the size grades exported.
Marketing study of SBN catches	Carried out by an international consultant (ODA). No significant improvements to income from the handling/marketing of the estuarine SBN catches were identified from this short study.
Investigations of SBN behaviour through field observations and by tank test	Investigations through field observations carried out by an international consultant. Due to poor visibility, underwater in *situ* examination of the behaviour was not possible. Based on the structure of the gear, some improvements may be achieved, but the significance of these will become evident only if a flume tank test is carried out.
Acquisition of computer and training for data processing	Done. All counterpart staff have been familiarized with the usage of various programmes for the assessments undertaken. Special software for SBN data analysis was also provided. Stock assessment packages, mostly on length-based methods, were provided.
Analysis and reporting	Completed by end December.
Seminar	Postponed till January 1992.

Assessment

The subproject is a very good example of learning about issues relating to practically all disciplines of fisheries – fishing technology, resources, post-harvest technology, aquaculture, socio-economics, their interaction and management matters. All counterpart staff, including the Project Director, worked wholeheartedly. The manual processing of data provided valuable experience and understanding of methodologies. The staff have, thus, acquired a good insight into the fundamentals of marine fisheries investigations. And the Government has more valuable information about marine and estuarine resources and fisheries in Bangladesh.

The subproject had to investigate and estimate basic parameters, such as production levels, species composition, seasonalities etc, for many of the marine fisheries, which were not available earlier. Relative impacts of these fisheries on common resources shared by different fisheries, such as some of the penaeid shrimp and demersal finfish, were assessed for management purposes. Valuable information on distribution of larvae and juveniles of some of the valuable shellfish and finfish species, and their relative abundance by area and season, were obtained. Socio-economic conditions and reliable estimates of monthly income of estuarine set bagnet fishermen in different areas, and the proportion of these fishermen needing assistance or other means of improving their livelihood, were made.

Targets 1992

- National seminar.
- Identification and promotion of follow-up.

Subproject : Bio-economics of Small-scale Fisheries in an Artificial Reef Area in *Thailand (RES/ART/THA)*

OBJECTIVES	(1) Bio-economic and socio-economic assessment of the effects of artificial reefs. (2) Identification and demonstration of fishing methods suitable for small-scale fisheries near artificial reefs.

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(3) Strengthening the capabilities of national staff in conducting such assessments.

STATUS 1990

Regional workshops were conducted to understand the concept of bio-economic assessment and to prepare a working document for the subproject.

A national workshop was held to assess past experiences in Thailand and to determine future approaches.

Targets 1991	*Achievements*
Ordering equipment	Items have been identified and quotations called for.
Training programmes for subproject staff and preparation of forms/questionnaires	Postponed till early 1992 because of delays in counterpart staff assignment, particularly for field work in socio-economics.
Compilation of catch statistics/data on commercial fisheries and surveys conducted prior to deployment of artificial reef	Commenced. Data for small-scale fisheries analyzed. Trawl data analysis to be ready soon. Socio-economic data have not been compiled due to the delay in assignment of counterpart socio-economist .
Assessment of income from fisheries prior to deployment by using catch rate from above and price of fish at that time	Delayed due to lack of staff.
Processing of post-deployment trawl survey, underwater visual observations and commercial catch **data** collected since 1989.	Delayed due to lack of staff.
Carry out underwater survey	Postponed until early 1992, due to poor underwater visibility.
Discussion between Project team and fisherfolk on utilization and protection of artificial reefs	Some discussions undertaken during the preliminary survey for the selection of villages for socio-economic survey.
Commencement of new **data** collection on the bio-economic and socio-economic aspects	Delayed till 1992. Preliminary socio- economic survey completed and three out of ten villages were selected for in-depth survey. The bio-economic survey is yet to start.

Assessment

Delayed start due to lack of counterpart staff, particularly assignment of coordinator and staff for socio-economic surveys.

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Targets 1992

- Training of samplers
- One year of data collection (extended till 1993)
- Compilation and processing of data
- Monitoring/workshop
- Assessment of existing fishing methods and practices

Future

- Completion of sampling and data collection and processing
- Identification of needs for new/innovation of fishing gear and fishing trials
- Analysis and reporting
- Communicating information to fisherfolk on utilization and management of artificial reefs

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Subproject : Bio-economics of a Shrimp Fishery in Malaysia, (RES/SHR/MAL)

OBJECTIVES	Assessment of the bio-economics of the fisheries exploiting the shrimp resources in the Kuala Sepetang District and to improve the capabilities of the national staff through on-the-job training on the methodologies introduced.
STATUS 1990	Regional workshops were held to understand the concept of the bio-economic approach and to prepare a working document for the subproject.

Targets 1991	*Achievements*
Review of available data on shrimp fisheries and ongoing research programme	The senior counterpart biologist assigned to the subproject has been involved in past studies of shrimp fisheries on the west coast and is familiar with the available information on past data and results. There is an ongoing monitoring study of the shrimp fishery by the FRI, which will be complementary to this subproject.
Procurement of equipment	Equipment were identified (micro-computer dinghy, OBM, SCT meter, insulated box) and quotations called for.
Training programme for samplers and junior biologists.	Not achieved.
Preparation of forms/ questionnaires	Completed for data collection forms on fishing operations, catches, biology, processing, other incomes, and socio-economic factors.
Shrimp larval sampling for recruitment studies	Not achieved.
Identification of additional data/information to be collected on the fisheries and biology of selected species	Not achieved.

Commencement of sampling programme	Not achieved.

Assessment

The start has been delayed due to lack of counterpart staff and recruitment of new personnel. Some concern about effective coordination arises from the fact that biological activities are supervised by FRI in Penang, while socio-economic aspects are looked after by the Department of Fisheries in Kuala Lumpur and the coordinator is based in Penang. The field biologist, socio-economist and samplers, being new recruits, will require considerable supervision and guidance in addition to the training to be provided.

Targets I992

- Training of field staff
- One year sampling (to be extended into 1993)
- Processing of data
- Exchange of information with fisherfolk
- Monitoring workshop

Future

- Completion of sampling
- Analysis and reporting
- Communicating results to the fisherfolk

Subproject : Assessment ***of Shrimp Fisheries on the East Coast of N. Sumatera, Indonesia*** ***(RES/SHR/INS)***

OBJECTIVES	(1) Assessment of bio-economics and socio-economics of the fisheries exploiting shrimp (penaeid) in a specific area, consideration of a preliminary management plan for shrimp fisheries, and identification of fishing method(s) that may provide optimum economic and social benefits from shrimp resources. (2) In the process, the fisheries officers and fisherfolk are expected to gain better understanding of the various aspects.
STATUS 1990	Subproject staff had participated in regional workshops to understand concepts of the bio-economics and to prepare a subproject document.

Targets 1991	*Achievements*
Training of staff	Postponed to February 1992 due to delay in assignments of counterpart staff.
Conduct frame surveys for fisheries and socio-economics, preparation of forms etc.	Frame survey for the shrimp fisheries and biological data was conducted. Four sampling stations were identified and stratified sampling programme determined. The geographical separation of fishing villages/communities according to fishing methods provides the stratification for socio-economic survey.

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Procurement of equipment	Items were identified and quotations called for.
Examination of available information of previous surveys	Not undertaken due to delayed assignment of counterpart staff.
Commencement of bio-economic and socio-economic investigations	Delayed.
Workshop to discuss progress	Postponed.

Assessment

Counterparts assigned towards the end of '91, but weak background of personnel for' bio-economic aspects causes concern. Besides technical support from Project personnel, backstopping on basic biological/stock assessment methods by scientific staff from Jakarta is strongly recommended. But distance between study area and Jakarta and cost of travel could become a serious constraint. Continuous monitoring of the field staff performance is essential for the success of this project.

Targets 1992

- Bio-economic and socio-economic surveys and data compilation
- Training of field staff
- Monitoring workshop
- Meetings with fisherfolk to exchange information

Future

- Completion of data collection
- Analysis and reporting
- Communicating information to fisherfolk

Subproject : Bio-economics of Small Pelagic Fisheries in Sri Lanka (RES/SPL/SRL)

OBJECTIVES	Bio-economic assessment of the exploitation of small pelagics by various fisheries, income distribution, likely socio-economic effects of different management regimes. Inservice training/education of project staff and fisherfolk in the various aspects involved.
STATUS 1990	Regional workshops were held to understand the concept of the bio-economic approach. Working document for the study was prepared.

Targets 1991	*Achievements*
Assignment of project staff and briefing	Biologists and research assistants were assigned by NARA and a socio-economist plus six Fisheries Inspectors were assigned by the Department of Fisheries.

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Review of available information	Previous biological studies on small pelagics and socio-economic surveys in the coastal area were reviewed by the respective counterparts.
Frame survey and identification of sampling sites	Number of units of various craft-gear combinations engaged in catching small pelagics, their distribution and seasonality in fishing were surveyed from Beruwela to Doddanduwa. Five stations were identified for sampling. The frame survey of villages was completed in December.
Preparation of forms and questionnaires	Completed
Training officers of NARA and Minfish	Sampling methodologies for bio- economic data was introduced to NARA field staff in November. Field staff in socio-economic frame survey were familiar with baseline survey techniques and special training was not required.
Commencement of data collection	Bio-economic data collection commenced in November. That for socio-economics will follow, in January 1992.
Briefing fisherfolk on aspects investigated and organization of their participation	First series of meetings between counterparts and fisherfolk were held at four of the sampling stations in October. Objectives and activities of the project were explained and issues raised by fisherfolk on resources and fishing techniques were discussed.

Assessment

The subproject has had a reasonably good start, but active and frequent monitoring by the officers concerned is required.

Targets 1992

- One year of data collection
- Processing of data
- Monitoring/Workshop
- Meetings with fisherfolk in the area

Future

- Analysis and reporting
- Communicating results to the fisherfolk

Project Inputs

The project has a budget of US$ 1.0 million over a period of 2 years 8 months starting from May 1991.

A Fishery Biologist is the only fulltime FAO professional staff of the project. However, considering the importance of the socio-economic aspects of the studies to be undertaken, a long-term consultant, a socio-economist, will join in January 1992, initially for eleven months, but with provision till

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the end of the project. Short-term consultants are foreseen in the field of bio-economics, fishing technology and extension/training.

Some of the work, e.g. any specific bio-economic or socio-economic survey work. hiring of fishing boats for fishing trials, preparation of special extension material in fishery resources and management, may be subcontracted to private or government organizations.

Organized training activities will consist of national workshops dealing with processing and analysis of survey data and of regional seminars exchanging experiences of the studies in different countries.

Major equipment components to be purchased are micro-computers diving equipment, oceanographic apparatus, underwater camera, FAD fabricating materials and fishing gear/hauling devices.

The operational expenses required are for hiring boats and vehicles and to cover the operational costs of government boats and vehicles for transport of project staff to and at the field stations, repairs to equipment, hiring of casual labour for field work and fabrication of FADs.

The total budget and estimated expenditure during 1991 are given in the table below.

RAS/91/006 : Budget and Expenditures in US $

Line	*Object of Exp*	*Budget Total*	*Budget 1991*	*Est.Exp 1991*	*Balance 1992-93*
10	Personnel	527,915	117,355	97,623	430,292
15	Duty travel	50,000	10,000	15,230	34,770
29	Subcontract	50,527	10,000	4,063	46,464
30	Training/seminar	118,206	20,000	11,187	107,019
40	Equipment/supplies	115,190	50,000	19,905	95,285
50	Miscellaneous	138,162	11,000	6,111	132,051
		1,000,000	218,355	154,119	845,881

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Appendix J

ASSESSMENT OF POLLUTION HAZARDS IN FISHERIES (SWEDMAR/SIDA)

Annual Report — 1991

INTRODUCTION

Apprehension of the negative impact on fisheries of pollution and environmental degradation has been expressed at Advisory Committee meetings since 1988. SIDA, therefore, decided to support a project designed to assess the possible effects of pollution on the fisheries and, at the Committee meeting in Colombo in 1991, this project was endorsed in principle. It was decided that the individual countries should be contacted and the degree of participation and operational arrangements discussed. All countries have, since, declared their interest in participating.

The project proposal generally felt that information on the effects of pollution and environmental degradation on fish was scattered, unsystematically recorded and not available in a comprehensible form to fisheries management institutions It was thought that much information within the environmental field existed in unpublished form and as raw data. There was a need, it was felt, for national institutions to collect, generate and share data on the environment and for a regional network to be established to exchange information among the different countries.

OBJECTIVES

Assessment of pollution problems, which may be affecting fisheries, by reviewing the existing information and analyzing available data.

PROGRESS OF WORK

Because of problems with such details as clearance and other permits, the Programme could not start until April 1991.

The following countries have, thereafter, been visited by the Environment Adviser : Sri Lanka, Thailand, Malaysia, Indonesia and the Maldives. A scheduled visit to Bangladesh in May had to be postponed because of the devastating cyclone and India could not be included in the travel itinerary in 1991 because of late notification of its interest in participating. Bangladesh will be visited in February 1992 and Tamil Nadu, Andhra Pradesh, Orissa and West Bengal between March and May 1992.

During the country visits it was found that it was not very difficult to get hold of information on the environmental situation. Nor was it as scattered as envisaged in the project proposal. All countries visited are well aware of the environmental risks and there is considerable cooperation between fisheries authorities, environmental authorities and universities. The environmental threats to fisheries are, to a great extent, known among the concerned agencies. Different foreign aid organizations are also involved in environmental activities, but there appears to be little coordination among them. Fortunately, the South Asia Co-operative Environment Programme, SACEP, is now coordinating all available environmental information among the South Asian countries, including Bangladesh, India, Maldives and Sri Lanka, and the UNEP's Regional Seas Programme for the East Asian Seas is doing the same for Thailand, Malaysia and Indonesia. Cooperation with these organizations has been established.

The BOBP project can contribute mainly by- helping to exchange more detailed and up-to-date information between the member countries, identify areas where more field studies, research and development must be done and suggest remedial action to improve conditions. This will be the target for the workshop in Penang in early 1993 and preparations for this are now underway in the countries visited.

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Sri Lanka

Contact was established with SACEP in Colombo. This organization has worked with environmental issues in the SAARC countries for over ten years and has recently worked out an action plan for the coastal environment in cooperation with the UNEP office in Bangkok. SACEP was very interested in cooperating with the BOBP environmental project and would report on the BOBP project in its newsletter.

A study of the effects on fisheries from the discharge of waste water from the Embilipitiya pulp and paper mill will be made in early 1992. The strategy for the study has been drawn up in cooperation with the Network for Industrial Environmental Management (NIEM) at the UNEP-office in Bangkok. The study is designed to supplement NIEM's chemical and physical measurements programme in Embilipitiya.

Thailand

Research and monitoring of the marine environment along the west coast have been carried out over the past two decades. Much information is, therefore, available, but most of it is only in Thai. Arrangements have been made for translation of relevant papers for further review.

The Andaman coast is still rather pristine compared with conditions in the Gulf of Thailand. Study trips to resort areas, mangrove forests and coral reefs revealed, however, that environmental degradation is taking place. Both legislation and its enforcement seem too weak to reverse this trend. LJSAID and the Thai authorities are cooperating on a Coastal Resource Management Project that has got underway and have proposed a conservation plan.

In Bangkok, contact was established with the regional UNEP office for Asia and the Pacific. Many of its activities are similar to the BOBP environmental project's and, consequently, much interest was shown in cooperating with the BOBP project. SIDA is funding the Network for Industrial Environment Management (NIEM) and this Programme is being implemented by the UNEP office. NIEM is mainly concerned with treatment facilities and chemical characterization of waste water from pulp mills and other industries. It therefore welcomed the supplementary inputs that BOBP could offer with its studies on the biological effects.

Malaysia

The increasing discharges of sewage from municipalities, piggeries etc. are causing concern to the fisheries on the west coast of Malaysia. Cockle farming has been banned in certain areas because of risks of bacterial infection and there are fears of the appearance of red tide. Shrimp have recently been killed by red tide on the southwest coast in the province of Johor Bahru. Heavy metals and pesticide residues in fish, crustaceans and molluscs are evidently no problem in Malaysia. Regular monitoring since the early 1980s has shown low residual values, usually far below the maximum permissible levels.

A study has been proposed to develop simple, appropriate field equipment to monitor water quality. Such equipment will help fish farmers to improve their management and local fisheries officers to investigate causes of fish kills etc.

Indonesia

Weak environmental legislation and inadequate enforcement had evidently been worrying the authorities for some time. An agreement on cleaning the rivers, the Prokasih decision, had been signed by 2000 industries in 1989, but a recent evaluation had shown that 403 had not yet met the government's environmental criteria. On October 23, 1991, the Minister for Population and

Environmental Affairs, Mr Emil Salim, ordered all industries to comply with the regulations of Law No.41/1982 before the end of December 1991 or face action.

The coasts of Sumatera, adjacent to the Bay of Bengal, are still in a relatively good environmental condition, with the exception of parts of the northeastern coast. If stricter enforcement of the environmental legislation is practiced, remedial action could, hopefully, be taken in the areas that have been damaged mainly by activities in connection with petroleum extraction.

A reported case of fish kill close to a tapioca mill in Sumatera aroused suspicion that discharged cyanides could be the cause. Concentrations of KCN of over 100 ppm were registered in the water. A study of possible effects of tapioca effluents on fish has been proposed and will, hopefully, be implemented in early 1992.

Maldives

There is deep concern about the ongoing degradation of the environment in the Maldives. The situation is most precarious in Male; where the freshwater lens is now more or less saline most of the year, where there is no space to store solid waste and where the sewage discharges are causing algal growth, at least by the northeastern pipe outlets. No other country is so dependent on a sustainable use of the environment as the Maldives.

Fisheries and tourism are the two main earners of foreign currency and both are very sensitive to even very small environmental changes. Even the tuna caught in the open sea have occasionally shown small residues of histamines and mercury. They are most likely of natural origin, but even a very small environmental change, like the addition of nutrients, can change the species composition of pytoplankton, and dinoflagellate blooms can produce fish poisons. Even diatoms like Nitschia ***pungens*** have recently been shown to cause amnesic shellfish poisoning, leading to human fatalities.

Studies of natural variations in tropical fytoplankton biomass and species composition and their impact on fisheries should be implemented. A better understanding of relevant food chains and associated conditions is also needed. The seas around the Maldives would be ideal for such studies since they are still pristine.

TARGETS 1992

- Collection of general information about the marine environment in Bangladesh and India.
- Continued detailed identification of areas where environmental degradation is causing problems for fisheries, locations of different types of pollution having an impact on fisheries, locations of pristine areas rich in valuable species that might qualify for protection or formation of marine reserves that would be of interest for research or for the preservation of genetic resources for fisheries.
- Suggestions for remedial action, such as types of waste treatment most beneficial to fisheries (for instance, biological methods without chemicals), better land management to decrease erosion and transport of silt, improved management to protect the coastal environment etc.
- Preparations for a workshop to be held in Penang, Malaysia, early in 1993 for about 50 participants.

  There will be individual country presentations on the present marine situation in the coastal areas and seas of the Bay of Bengal and specialist presentations on the environmental status of mangroves, coral reefs and sea grass beds in the Bay of Bengal. Methods of improving the environmental situation in ways beneficial to fisheries and "The environment and fisheries in the Bay of Bengal" will be discussed. Recommendations of actions to be taken to improve conditions in the Bay of Bengal will be made at the conclusion of the deliberations.

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Appendix K

CLEANER FISHERY HARBOURS OF THE BAY OF BENGAL

Project Report

BACKGROUND

Development of the fisheries in all countries in the region can primarily be attributed to the increase in the fishing fleet in general and motorized boats in particular. This fleet comprises small day-boats exploiting the inshore waters as well as larger boats for harvesting fish resources in offshore and distant waters. Though a large portion of the overall fish production is from traditional boats operating from beaches and small fishing centres, the increasing number of motorized boats has resulted in the creation of fishery harbour complexes to provide facilities for berthing, handling of fish catches, bunkering and boat supplies.

Some larger harbours have been integrated with main ports, while several have been established exclusively for fishing boats. The main ports are required to comply with international and national regulations and measures with regard to pollution and the infrastructure to deal with it. Such measures and regulations are either not acceptable to or are not enforced in the fishery harbours and landing places.

The main activities in such places, *viz*. fish handling, bunkering, fish marketing and boat repairs, generate pollutants in proportion to the size of the fleet and the number of people using the harbour. Pollution can be in the form of oil leaks, bilge discharge, fish waste and garbage. In many cases, effluents from nearby industries and sewage discharge into the harbour exacerbate this problem. Such pollution can have a detrimental effect on the quality of fish handled at such centres, besides creating an unhygienic environment.

The IMO's Global Programme for the Protection of the Marine Environment concentrates on activities of a catalytic nature, designed to support national and regional action to enhance marine environment protection. Improvement of the port environment and collection of baseline information for pollution problem identification and assessment are two issues which are also of concern to the BOBP, with particular reference to fishing harbours and landing centres.

A pilot project to 'provide reception facilities for oil bilge discharge and garbage' was sponsored by the IMO and executed by the BOBP during 1988-89 in the Vishakhapatnam fishing harbour, India. Under this project, collection of baseline information, provision of facilities for oily wastes and garbage disposal and education of harbour users to create an awareness of how the harbour could be **kept** clean by utilizing the equipment provided were the main components.

This project drew the attention of BOBP member countries and it was expressed during the 1990 Advisory Committee Meeting, that surveys in each country be undertaken to assess the situation at some important fishing harbours and landing centres. As a result, the project 'Cleaner Fishery Harbours in the Bay of Bengal' was sponsored by IMO and formulated and executed by the BOBP during 1991 at a total cost of US$ 60,000 (IMO US$ 45,000).

OBJECTIVES

While the development objective of the project is to create an environment in fishery harbours/landing centres conducive to hygienic handling of fish, the immediate objectives were to

- conduct surveys of selected fishing harbours/landing centres to obtain baseline information on pollution factors and how they affect the port environment and fish quality; and
- organize a regional consultation to discuss the findings of the surveys and recommend follow-up action.

PROGRESS OF WORK

Fishing harbours and/or landing centres were selected by each member country, taking into account that only those bordering the Bay of Bengal be considered to meet the mandate of BOBP. No doubt other locations require attention and it is hoped that baseline information will be collected for these too in due course.

FISHING HARBOURS/LANDING CENTRES SURVEYED

Indonesia	–	Belawan, Lampulo, Bungus
India	–	Kakinada, Madras, Tuticorin
Maldives	–	Male, Felivaru
Malaysia	–	Batu Maung, Kuala Kedah
Sri Lanka	–	Beruwela, Galle, Tangalle
Thailand	–	Ranong, Phuket, Satun

N.B : In Bangladesh, surveys of Cox's Bazaar, Chittagong and Khulna could not be conducted in time for the consultation.

Surveys in each country were conducted over a period of three weeks by teams of national experts in the fields of marine pollution and post-harvest technology. The budget and time frame for the project did not permit any detailed testing of water or fish samples. However, the findings were well supported by visual records in the form of slides and video.

A regional consultation was organized December 9-l 1, 1991 at Penang, Malaysia. Besides national consultants involved in the surveys, a representative fro'm each member country, connected with the management of fishing harbours participated. Other delegates included representatives from IMO, FAO and BOBP. Findings of the surveys were highlighted in the presentation by each national team with photo slides and video recordings.

RESULTS

Status reports on selected fishing harbours have been compiled for each country. These reports contain information on the size of the fishing fleet, quantities of fish landed per annum, available infrastructure and facilities. Pollution factors affecting the port environment and fish quality have been listed under three categories, viz. vessel-generated, user-generated and from external sources. Each report also contains recommendations by the teams on remedial measures.

The consultation noted that though some of the problems were specific to a particular harbour, there were several issues common to the various harbours. Such as :

- Harbour water pollution was mostly organic in nature;
- Inadequate facilities for garbage collection and disposal, including fish waste;
- Inadequate toilet facilities and treatment system for wastes;
- Lack of awareness by users and managers on the effect of pollution on fish quality and general health standards; and
- Pollution from external sources by way of sewage discharged into the harbour and effluents from industries.

The most important fact was that washing of fish using polluted harbour water was a common practice.

While discussing these findings, it was noted that there were two distinct follow-up actions that were required.

In the short-term, it was felt that needs were :

- the immediate cleaning up of harbours;
- improving facilities for garbage collection and disposal;
- provision and/or rehabilitation of basic facilities in the harbour for toilets and fresh water;
- extension activities to organize the various groups involved to collectively address the problem;
- awareness building among fisherfolk, traders, administrators and others involved, including children, on the importance of hygiene and food quality; and
- achieving voluntary acceptance by users of guidelines for the use and upkeep of the harbours.

It was emphasized that management aspects would have to be accorded a high priority to ensure adherence to guidelines and established rules. Due note should be taken of the economic loss that may result through non-compliance with good standards and practices.

To address environmental degradation affecting small-scale fisheries beyond the confines of fishing harbours, in the long-term, it was felt that integrated planning was required to enable all those responsible for environment, urban planning, industrial development, health and fisheries to collectively address environmental issues affecting the fisheries sector.

To provide the above group with information to justify pursuance of these matters, there is a need to establish minimum standards and requirements for water quality, disposal of waste from industry and treatment of both solid and liquid wastes. Future surveys should undertake in-depth analysis of water quality.

The consultation also took note of the fact that for fishing harbours to be properly maintained and to provide essential services, revenue should be generated. Payment for services and facilities, together with education, could make users more responsible for the quality of fish handled and maintaining the cleanliness of the harbour.

Appendix L

NATIONAL PROJECTS IMPLEMENTED THROUGH BOBP

Annual Report — 1991

Four national projects with funding arrangements separate from the regional projects, were implemented through BOBP in 1991.

Project : Reef Fish Research and Resources Survey in the Maldives — Phase II (MDV/88/007)

This project was funded by UNDP (US $366,000) and had a duration of nearly three years (January 1989 – September 1991). The purpose was to assess resources and identify potential for increased production and utilization of reef fish in the Maldives. Phase I of the survey (1987-88) had covered only the Male Atoll, while this project covered three "typical" atolls, Shaviyani in the north Alifu in the centre and Laamu in the south. Bottom longlines and handlines were the primary gear used during the survey.

The survey resulted in an estimate of 30,000 ± 13,000 t/year as the maximum potential yield of commercially valuable reef fish. The survey also revealed significant differences in the composition of species in the catches. Catch rates exhibited higher abundance of reef fish in the northern and central atolls than in the southern one. Catch rates also increased with depth, but declined beyond about 180 m. New records of species in the Maldives and Indian Ocean were made and a few new species were caught and are being worked on by international ichthyologists. (See further details in ***Bay*** of ***Bengal News No*** 45 and BOBP/WP/80.)

Logistic constraints hinder increased production for export – lack of infrastructure facilities and scattered landings. Tourist resorts and expatriates in Maldives are the main buyers of reef fish, but there is a growing acceptance of reef fish among Maldivians. Low value, salt dried reef fish is exported to Sri Lanka.

An international consultant studied the Giant Clam fishery which started in 1990 for the export of frozen or dried meat to Taiwan. Of the two species in the Maldives, the larger one is fished out in some of the atolls. Over 10 t of meat was collected from some 70,000 clams. Urgent need for management was alerted and subsequently acted upon by the Government. Possibilities of culture practices to replenish the depleted stocks, and to contribute to increased production, were indicated. (See further details in ***Bay of Bengal*** News, No. 42 and BOBP/WP/72.)

Another consultancy on the sea cucumber fishery (Beche de mer), revealed that, of about nine species, the two most valuable ones were exploited initially and that, as production increased, they were too intensively fished. Consequently the production of other, relatively less valuable species increased significantly in a five-year period. Urgent need for management of the resource was highlighted (See ***Bay*** of ***Bengal News,*** No.43 and BOBP/WP/79).

Project : Extension Training for Fisherfolk, Sri Lanka (SRL/87/003)

This Project, funded by UNDP (US $ 670,000), set out, in 1988, as a separate national project to establish a fishery extension service. For various reasons, however, the focus on the Project has primarily been on strengthening the extension capability of field staff through inputs of training, equipment and extension materials. In July 1990, on the departure of the Project's Chief Technical Adviser, the Project was brought under the umbrella of BOBP.

The Project, scheduled to be terminated in mid-1991, was reviewed by a national expert, and the review, while looking upon the Project's efforts positively, pointed out that the real concern was that the translation of the Project's inputs into some form of extension output to fisherfolk was in question because the Ministry of Fisheries and Aquatic Resources (MFAR) does not have a clearly

articulated policy and strategy on fisheries extension. Nor does it have the organizational support to facilitate extension. Further, the extension needs of the fishery sector are not fully known.

The Project was extended to the end of 1991, with no increase in budget, primarily to complete its targets, but also to field an extension needs analysis study and to finance a UNDP project formulation mission with a mandate to develop a technical assistance project to enable MFAR to build up its capacity to carry out the fisheries development plan of the country.

The targets set out in the Project have been more or less met, *i.e.* to provide training to extension staff, to supply extension and training equipment and to produce extension and training publications. The needs analysis was completed and used as an input to the UNDP Project Formulation Mission, which has formulated a five-year project focussing on strengthening and improving marine fisheries management in Sri Lanka.

Project : Motorization of Chandi Boats in Bhola District, Bangladesh
(DE V/MCB/BGD)

This project is sponsored by DANIDA (US $ 180,000) and has a duration of about three years (1990-92). The immediate objective is to motorize some fifty *chandi* boats in Bhola District, thereby improving the income of the small-scale fishermen through increased productivity.

Since there was a delay in obtaining the necessary funding because of Government procedures, BOBP started by motorizing ten boats in January 1988 and ten more in June 1988. DANIDA funds became available in April 1990 and the engines were procured. 17 engines were installed and about 100 operators were trained by the field officers and mechanics of the Project in that year.

During 1991, twenty more engines have been issued and corresponding training conducted. The monitoring of performance is in progress. Repayment of loans was adversely affected as a result of the damage caused to some of the beneficiaries during the cyclone. The percentage of repayment was around 30 per cent.

The progress so far has been fairly satisfactory, in spite of the relatively low rate of loan recovery, which was primarily due to cyclone damage. The interest taken by the upazilias and the other organizations in the project is another noteworthy result. As a follow-up of the motorization, BOBP (GCP/RAS/118/MUL) has also granted loans as start-up capital for *chandi* boat fishermen to rid themselves of indebtedness to middlemen. (See *Buy of Bengal News, No. 44.)*

Project : Rehabilitation of Cyclone and Tidal Bore Affected Artisanal Fishermen
(FAO/TCP/BGD/0156 E)

This project came about as a response to the colossal damage sustained by the fisheries sector following the cyclone and tidal bore of April 29, 1991. After comprehensive damage assessment carried out by DOF officials in Bhola, Noakhali and Chittagong Districts with the assistance of BOBP, the FAO-funded project began in July 1991 by identifying areas and allocations of inputs to be dispersed. Funds, to the tune of US $ 245,000, are provided by FAO under its Technical Cooperation Programme (TCP).

DOF officers in consultation with BOBP field staff, NGOs and fisherfolk organizations identified, beneficiaries. Funds could be dispersed on certification of repairs/construction of craft. Fishing gear was directly distributed to beneficiaries. By October 1991, almost all inputs had been distributed. The Project, which is being monitored by a committee consisting of representatives of the Ministry, DOF, FAO and BOBP is due to conclude in February 1992.

PUBLICATIONS OF THE BAY OF BENGAL PROGRAMME (BOBP)

The BOBP brings out the following types of publications :

Reports (BOBP/REP/...) which describe and analyze completed activities such as seminars, annual meetings of BOBP's Advisory Committee, and subprojects in member-countries for which BOBP inputs have ended.

Working Papers (BOBP/WP/...) which are progress reports that discuss the findings of ongoing BOBP work.

Manuals and Guides (BOBP/MAG/...) which are instructional documents for specific audiences.

Information Documents (BOBP/INF/...) which are bibliographies and descriptive documents on the fisheries of member-countries in the region.

Newsletters (*Bay* of *Bengal* News) which are issued quarterly and which contain illustrated articles and features in non-technical style on BOBP work and related subjects.

Other publications which include books and other miscellaneous reports.

A list of publications from 1986 onwards is given below. A complete list of publications is available on request.

Reports (BOBP/REP/...)

23. *Summary Report of BOBP Fishing Trials and Demersal Resources Studies in Sri Lanka.* (Madras, March 1986.)
24. Fisherwomen's *Activities* in *Bangladesh* : A Participatory *Approach to Development.* P. Natpracha. (Madras, May 1986.)
25. *Attempts to Stimulate Development Activities in Fishing Communities in Adirampaftinam, India.* P. Natpracha, V. L. C. Pietersz. (Madras, May 1986.)
26. *Report of the Tenth Meeting of the Advisory Committee.* Male, Maldives. 17-18 February 1986. (Madras, April 1986.)
27. *Activating Fisherwomen for Development through Trained Link Workers in Tamil Nadu, India.* E. Drewes. (Madras, May 1986.)
28. *Small-scale Aquaculture Development Project in South Thailand : Results and Impact.* E. Drewes. (Madras, May 1986.)
29. *Towards Shared Learning : An Approach to Non-formal Adult Education for Marine Fisherfolk of Tamil Nadu,* India. L. S. Saraswathi and P. Natpracha. (Madras, July 1986.)
30. *Summary Report of Fishing Trials with Large-mesh Driftnets in Bangladesh.* (Madras, May 1986.)
31. *In-service Training Programme for Marine Fisheries Extension Officers in Orissa, India.* U. Tietze. (Madras, August 1986.)
32. *Bank Credit for Artisanal Marine Fisherfolk of Orissa, India.* U. Tietze. (Madras, May 1987.)
33. *Non-formal Primary Education for Children of Marine Fisherfolk in Orissa, India.* U. Tietze, Namita Ray. (Madras, December 1987.)
34. *The Coastal Set Bagnet Fishery of Bangladesh — Fishing Trials and Investigations. S.* E. Akerman. (Madras, November 1986.)
35, *Brackishwater Shrimp Culture Demonstration in Bangladesh.* M. Karim. (Madras, December 1986.)
36. *Hilsa Investigations in Bangladesh.* (Colombo, June 1987.)
37. *High-Opening Bottom Trawling in Tamil Nadu, Gujarat and Orissa. India : A Summary of Effort and Impact.* (Madras, February 1987 .)
38. *Report of the Eleventh Meeting of the Advisory Committee.* Bangkok, Thailand, March 26-28, 1987. (Madras, June 1987.)
39. *Investigations on the Mackerel and Scad Resources of the Malacca Straits.* (Colombo, December 1987.)
40. *Tuna in the Andaman Sea.* (Colombo, December 1987.)
41. *Studies of the Tuna Resource in the EEZs of Sri Lanka and Maldives.* (Colombo, May 1988.)
42. *Report of the Twelfth Meeting of the Advisory Committee.* Bhubaneswar, India, 12-15 January 1988. (Madras, April 1988.)
43. *Report of the Thirteenth Meeting of the Advisory Committee.* Penang, Malaysia, 26-28 January 1989. (Madras, March 1989.)
44. *Report of the Fourteenth Meeting of the Advisory Committee.* Medan, Indonesia, 22-25 January 1990. (Madras, April 1990.)
45. *Report of the Seminar on Gracilaria Production and Utilization in the Bay of Bengal Region.* (Madras, November 1990.)
46. *Exploratory Fishing for Large Pelagic Species in the Maldives.* R.C. Anderson and A. Waheed. (Madras, December 1990.)
47. *Exploratory Fishingfor Large Pelagic Species* in *Sri Lanka.* R. Maldeniya and S.L. Suraweera. (Madras, April 1991.)
48. *Report of the Fifteenth Meeting of the Advisory Committee.* Colombo, Sri Lanka, 28-30 January 1991. (Madras, April 1991)
49. *Introduction of New Small Fishing Craft in Kerala.* O.Gulbrandsen and M.R. Andersen. (Madras, January 1992.)
50. *Report of the Sixteenth Meeting of the Advisory Committee.* Phuket, Thailand, 20-23 January 1992. (Madras, April 1992.)

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Working Papers (BOBP/WP/...)

27. *Reducing* fhe Fuel *Costs* of Small *Fishing Boats. 0.* Gulbrandsen. (Madras, July 1986.)
38. *Credit for Fisherfolk : The Experience in Adirarnpattinam, Tamil Nadu, India.* R. S. Anbarasan and 0. Fernandet. (Madras, March 1986.)
42. *Fish Trap Trials in Sri Lanka.* (Based on a report by T. Hammerman). (Madras, January 1986.)
43. *Demonstration of Simple Hatchery Technology for Prawns in Sri Lanka.* (Madras, June 1986.)
44. *Pivoting Engine Installation for Beachlanding Boats.* A. Overa, R. Ravikumar. (Madras, June 1986.)
45. *Further Development of Beachlanding Craft in India and Sri Lanka.* A. Overa, R. Ravikumar, 0. Gulbrandsen. G. Gowing. (Madras, July 1986.)
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47. *Growth and Mortality of the Malaysian Cockle* (Anadara granosa) *under Commercial Culture : Analysis through Length-frequency Data.* Ng Fong Oon. (Madras, July 1986.)
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